Executive Education for Engineers

Part-Time Master Programs & Certificate Courses
»Professional development in the sense of lifelong learning, talent management, and human resources development strategies are drivers for the success of globally acting companies in the future. Even highly qualified professionals need to continuously update their know-how, since paradigm shifts in technology develop very frequently. As we are the first who developed an academic part-time program for professionals in which they can participate in while they continue working in their field, we can assure you that all our experience is integrated to guarantee a successful Master-degree and sustainable achievements in the industry.«
Technology Business School of the KIT

The Karlsruhe Institute of Technology (KIT) is the largest institution for research and education in Germany. Globally known for its technology expertise in German engineering, KIT is famous for its research, excellent scientific education, lifelong learning, comprehensive advanced training, and a sustainable culture of innovation.

Continuous Education on the Highest Academic Level

The HECTOR School is the Technology Business School of the KIT named after Dr. Hans-Werner Hector, one of the co-founders of SAP AG. The school endeavors to provide professionals with state-of-the-art technology expertise and management know-how in part-time education formats. With Executive Master Programs, Certificate Courses, and Customized Partner Programs, the HECTOR School fosters lifelong learning approaches of its industry partners and the executive development of its graduates.

Your Success is Our Vision

The HECTOR School strives for sustainable and continuous education on the highest academic level, building on more than 10 years of experience. The growing need for qualified engineers, computer scientists, and economists demonstrates HECTOR School’s vision: sustainable success of our graduates & their companies.

Executive Education @ HECTOR School

4 Reasons for the Technology Business School of the KIT

1. **Technology Transfer & Innovation**
   From one of the best engineering universities worldwide, the Karlsruhe Institute of Technology (KIT).

2. **Management & Technology**: The combination makes our programs unique. This ensures the sustainable competitiveness of companies.

3. **Power of Networks**
   Is supported professionally between academia and industry as well as across industries worldwide.

4. **Part-Time Programs**
   Guarantee perfect planning for participants as well as for their companies and enable simultaneous study and work.
A Strong Cooperation with Industry
Lifelong Learning Programs Foster Innovation and Competitiveness

Challenges for Industry
Battle for talents, retaining talents, employability, talent management: With the focus on lifelong learning in strategic HR development, companies strengthen their image, address current challenges and gain attractiveness for high potentials and professionals.

Advantages for Industry
According to the first results of the Bologna Process, employers need to be aware that bachelor graduates plan on completing master programs, even after starting their professional careers. By offering clear development structures, companies attract motivated employees and enhance their retaining factor. On the other hand, professionals optimize their competency profile and their employability by participating in continuous education programs. In times of fast changing markets and globally oriented companies, this will be a key factor for personnel career development for companies as well as for the employees.

The advantages of lifelong learning programs in cooperation with universities, given a highly academic yet practical oriented approach, are manifold:

- Technology Transfer & Innovation
  Industry benefits from state-of-the-art research findings at KIT. Participants of HECTOR School programs are trained at the highest academic level. They will act as interfaces between their companies and KIT. The master thesis for master programs, for example, is often the start of an intensive cooperation through joint innovation projects.

- Management & Technology
  Equipped with scientific methods and state-of-the-art knowledge in their field of technology expertise, combined with management and digitalization know-how, participants increase the creativity and innovative potential of their company. Furthermore, professionals become prepared for future career steps in executive positions.

- Power of Networks
  In times of global and cross-linked markets, a network of international peers and partners is indispensable. The HECTOR School graduates will not only gain valuable contacts within KIT but also to an extensive professional network of alumni worldwide.

- Part-Time Programs
  The HECTOR School programs allow their participants to gain high-level academic further qualification while being able to work at the same time. Due to the part-time approach of all programs, professionals can continue their challenging careers.

Portrait of the HECTOR School on our YouTube Channel
HECTOR School: Strategic Partner for the SIEMENS AG

»The master programs at the HECTOR School are a great opportunity to advance qualified employees. We appreciate especially the fact that our employees gain latest results of research of the KIT. The part-time structure and the modular composition enable us to integrate the participation in our operational work. For these reasons the master programs are an established method to be one-step ahead of our competitors for several years.«

Sebastian Hennig
Academic Advisor & Trainer, Siemens AG

ABB AG • Alcatel Transport Solutions Deutschland GmbH • Alcatel-Lucent Deutschland AG • Audi AG • BASF • BASF Business Services GmbH • BBAnk eG • Behr GmbH & Co. KG • Behr-Hella Thermocontrol GmbH • Blohm+Voss Nordseewerke GmbH • BMW Group • Bombardier Transportation GmbH • Robert Bosch GmbH • Brose • Continental AG • DAIMLER AG • DB Fernverkehr AG • DB ProjektBau GmbH • DZ Bank AG • Eisenmann • El-Khayyat • ELO Digital Office GmbH • EnBW • Endress + Hauser GmbH & Co. KG • Enpower Energy Corp. • EUROHYPO AG • Fine Hygienic Paper Co. Ltd/Nuqul Group • Freescale Semiconductor Inc. • Hikma Pharmaceautical PLC • Howaldtswerke-Deutsche Werft GmbH • IBM • Karl Dungs GmbH & Co. KG • Krones AG • KSB AG • Landesbank Baden-Württemberg (LBBW) • Lufthansa Technik Hamburg • MAG IAS GmbH • MAN Nutzfahrzeuge AG • MBtech Consulting GmbH • MELEC GmbH • Melexis GmbH • MTU UK Ltd. • Navistar International • OBE, Ohnmacht & Baumgartner GmbH & Co KG • P3 Ingenieurgesellschaft • MBH • Parsons Brickerhoff • Porsche AG • PROMATIS software GmbH • Reuters AG • Rexroth Star GmbH • Rothe Erde GmbH • SAMARCO Brazil • SAS Automotive Systems • Schaeffler KG • SEW-EURODRIVE GmbH & Co KG • Sicotel • Siemens AG • Telekom AG • Thales Transportation Systems GmbH • ThyssenKrupp Marine Systems AG • ThyssenKrupp Technologies AG • Ti Automotive • T-Systems • Unilever • Vale • Verband der Deutschen Bahnindustrie (VDB) • Vibracoustic GmbH & Co. KG • XING AG Examples for companies where HECTOR School participants are employed

HECTOR SCHOOL
Technology Business School of the KIT

Executive Master of Science: 6 Programs Combining Engineering & Management Know-how

HECTOR SCHOOL
Technology Business School of the KIT

State-of-the-Art Technology Expertise in Compact Education Formats:
Certificate Courses | Company-Individual Trainings | Leadership 4.0 Program | MBA Fundamentals Program
The HECTOR School offers six part-time master programs designed for professionals in leading positions. The master programs are more than typical MBA programs as they combine management with engineering expertise. The primary goal is to enable professionals to take a holistic approach when managing highly interdependent processes. All programs are completed with a Master of Science degree from the Karlsruhe Institute of Technology (KIT).

Leadership Know-How for Engineers
All programs share five management modules providing the participants with general knowledge in finance, accounting, marketing, international multi-project management, international law, human resource management or innovation management. Therefore, they can consider the commercial implications of project decisions.

Technology Expertise: More Than Just an MBA
In addition to the management modules, five engineering modules in each specialization convey state-of-the-art technology know-how and the methodology necessary to master the scope of new technologies.

Aquire Competencies to Succeed with Digitalization
Products, services and processes are translated into a digital representation – aiming higher productivity and efficiency. To fulfill this, corporate divisions are asked to develop a systematic and holistic approach for the increased use of digital components. All Master’s programs consider digitalization on a comprehensive level.

Part-Time Structure for Professionals
The academic calendar for the master programs starts annually in October. It consists of 10 modules, each with a duration of 10 days. Intermittent periods of lectures are scheduled to allow participants to continue with their demanding careers whilst acquiring new skills.

All master programs are taught in English. They are completed within approximately 20 months. Workshops and case studies provide ample opportunities to explore the direct applications of the module contents simulating a real business environment.

Master Thesis as an Innovation Project
The master thesis allows participants to work independently, reflecting their own company’s needs and their specific business environment. Most companies and participants take this opportunity to set up innovation projects as a master thesis and gain outstanding added value through the consultation of such projects by professors from KIT.

International Orientation for Global Success
At HECTOR School, the participants benefit from the vivid intercultural exchange with fellow students from all over the world. The international orientation is also anchored in the curriculum. All course content is considered in international settings and global contexts. Furthermore, certain modules are taught on-site at one of HECTOR School’s international partner institutions, e.g. at the ESADE Business School in Barcelona or the KIT China Branch in Suzhou.
Management Modules within all Master Programs

The six different Master Programs all share five management modules where the latest theories and methods in management are conveyed. Participants from different branches and international locations can exchange their expertise, discuss current technological and commercial challenges from different viewpoints and build up a sustainable network of peers.

Aim: 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 (STRATEGY & PEOPLE), and the company (FINANCE & VALUE).

Management Modules

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<tr>
<th>Module</th>
<th>Title</th>
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<tbody>
<tr>
<td>MM 1</td>
<td>Marketing &amp; Information</td>
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<tr>
<td>MM 2</td>
<td>Finance &amp; Value</td>
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<td>MM 3</td>
<td>Decisions &amp; Risk</td>
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<td>MM 4</td>
<td>Innovation &amp; Projects</td>
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<td></td>
<td>Corporate Innovation and Entrepreneurship (EEM)</td>
</tr>
<tr>
<td>MM 5</td>
<td>Strategy &amp; People</td>
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Prof. Dr. Stefan Nickel  
Institute of Operations Research, KIT  
Master Program MPD

Prof. Dr. Martin Klarmann  
Institute of Information Systems and Marketing, KIT  
Master Programs EEM, MSEM, POM

Prof. Dr. Martin E. Ruckes  
Institute of Finance, Banking, and Insurance, KIT  
Master Programs FE & ISEM

Co-Program Directors Management Modules
Six Master of Science Programs (M.Sc.)
State-of-the-Art Technology Combined with Management Skills

M.Sc. in Management of Product Development (MPD)
Prof. Dr.-Ing. Dr. h.c. Albert Albers
Institute of Product Engineering, KIT
Program Director MPD

»Product development is the driver of innovation. In MPD, you learn to manage product development in an efficient, methodical, creative and success-oriented way. With the scientifically sound and practice-oriented training program for professionals, you become qualified to be the driving force for successful product innovation in your company.«

Engineering Modules
- EM 1 Integrated Product Development by ASD – Agile Systems Design
- EM 2 Design & Validation Process and Information Systems for Product Development (PD)
- EM 3 Simulation and Target Values in PD
- EM 4 Validation and Verification in PD
- EM 5 Tools and Methods of Product Engineering

M.Sc. in Production & Operations Management (POM)
Prof. Dr.-Ing. Kai Furmans
Institute for Material Handling & Logistics, KIT
Academic Director of the HECTOR School and Program Director POM

»The design and operation of production systems and supply chains is undergoing a rapid change. Driven by new technology, as reflected by industry 4.0, the education of the past is no longer sufficient to guide companies through the changes. A master in POM equips participants with the necessary competences, bridging the gap between up-to-date theories and advanced technologies.«

Engineering Modules
- EM 1 Fundamentals in Production & Operations Management
- EM 2 IT Support of Production Systems
- EM 3 Methods of Operations Management
- EM 4 Networks of Supply & Production Systems
- EM 5 Global Production & Distribution Systems

M.Sc. in Mobility Systems Engineering & Management (MSEM)
Prof. Dr.-Ing. Eric Sax
Institute for Information Processing Technology, KIT
Program Director MSEM

»The Master Program MSEM offers a unique combination of courses in emerging technologies & systems engineering. Processes, methods and tools for the challenges of future mobility in e-drive, autonomous driving, communication-over-the-air, and worldwide release & configuration management are introduced on the engineering as well as on the management side.«

Engineering Modules
- EM 1 Processes, Methods & Tools of Systems Engineering
- EM 2 Systems Design
- EM 3 Systems Integration & Validation
- Specialization Advanced Driver Assistance Systems (ADAS)
- EM 3 Functions of ADAS
- EM 4 Components & Technologies of ADAS
- Specialization e-Mobility
- EM 3 E-Mobility: Political & Technical Framework
- EM 4 E-Mobility: Components & Technology
M.Sc. in Energy Engineering & Management (EEM)

Prof. Dr.-Ing. Hans-Jörg Bauer
Institute of Thermal Turbomachinery, KIT

Prof. Dr.-Ing. Marc Hiller
Institute of Electrical Engineering, KIT
Program Directors EEM

»The energy transition is associated with many challenges, such as an increase in efficiency of energy conversion systems based on renewable energies and their integration into future energy systems. This requires e.g. the development of capable energy storage systems and an intelligent demand side management. EEM covers all these aspects and provides the skills to successfully face the challenges.«

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

M.Sc. in Financial Engineering (FE)

Prof. Dr. Marliese Uhrig-Homburg
Institute of Finance, Banking, and Insurance, KIT
Program Director FE

»Fast-evolving financial markets constantly set new challenges while progress in quantitative tools and computer technology open up entirely new opportunities. The finance industry needs people with in-depth knowledge of financial theory, mathematical tools, and information technology as well as adequate methods of engineering and management tools. FE prepares professionals perfectly for these requirements.«

Engineering Modules
EM 1 Digital Platforms
EM 2 Global Financial Markets
EM 3 Valuation & Financial Analytics
EM 4 Advanced Financial Engineering
EM 5 Risk Management

M.Sc. in Information Systems Engineering and Management (ISEM)

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

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

»We are living in a digital world. Rapidly evolving information technologies drive the digital transformation of products, services, and organizations. Successful enablers of digital transformation require a profound understanding and integration of business and information technology.«

Engineering Modules
EM 1 Digital Platforms
EM 2 Software Engineering
EM 3 Process & Knowledge Engineering
EM 4 Security & Privacy Engineering
Specialization
EM 5 Digital Services
EM 5 Autonomous Robotics
### Key Facts: Part-Time Master of Science (M.Sc.) Programs

#### Program Structure
- Part-time, 10 x 2-week modules
- Duration of approx. 20 months
- Master thesis = project work in the company
- 5 Engineering and 5 Management Modules
- Teaching language: English
- Yearly program start: October

#### Academic Degree
Master of Science (M.Sc.) from the KIT

#### Admission Requirements
- A first academic degree: e.g. Bachelor, Master or Diploma
- At least 1-2 years work experience (depending on the level of the first degree, recommended > 3 years)
- If English is not your mother tongue nor has it been the language of instruction for the last five years, language proficiency is required, e.g. test certificate (e.g. TOEFL score of at least 570 PBT; 230 CBT; 90 iBT or IELTs at least 6.5 points) or appropriate proof of C1 level.

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

#### Crash Courses
- Nov 09–13, 2020: 5-day seminar in Selected Topics of "Electrical Engineering" or "Thermodynamics, and Fluid Mechanics"
- Nov 13–14, 2020: 2-day seminar in "Probability and Statistics"

The academic calendar for each program starts annually in October. It consists of 10 modules, each with a duration of 2 weeks. All programs conclude with a master thesis.

#### Master Thesis
- ISEM, FE: 6 months project work
- MPD, POM, MSEM, EEM: 9 months project work

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<tr>
<th>September 2020</th>
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<td>28 29 30</td>
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<td>01 02 03 04</td>
<td>05 06 07</td>
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</table>

### Program Modules and Exams
- **MM** Management Modules
- **EM** Engineering Modules
- **Exams**

Please note: Dates are subject to change.
A HECTOR School Master:
Leadership Know-How for Demanding Careers.

»I have lively memories of my application interview for the HECTOR School and Prof. Kai Furman’s promise: “We will make you push your limits.” An inspiring international environment, people from different industries and working fields, and the link to a state-of-the-art understanding of production and logistic systems provided me with a solid basis for the progression of my professional career. A challenging and enriching experience – promise kept!«

Stefan Oehmke
Master in Production & Operations Management
VP Europe, Business Area Chassis Mounts, TrelleborgVibracoustic

Global Network of Industry Partner & Peers
HECTOR School participants come from all over the globe. This fosters intercultural exchange with other professionals. Due to the holistic approach of the HECTOR School, participants share the management modules with peers from different industries and backgrounds. This guarantees a worldwide and interdisciplinary network lasting a lifetime.

After graduation, the HECTOR School offers a professional network with alumni activities, reaching from social media channels to alumni meetings in cooperation with exclusive industry partners.
State-of-the-Art Technology Expertise in Compact Education Formats
Tailor-made programs for Managers and Engineers

Customized Training for Companies

Customized lifelong learning solutions form one of the key competencies of the HECTOR School. Paradigm shifts in technology call for high-end trainings for engineers. Engineers in all industries need a regular update in state-of-the-art technology expertise to secure their personal career path as well as the future technology development of their companies.

The HECTOR School Academy addresses these needs and provides programs to equip employees with specialized training in their specific field. Companies master the digital transformation with current know-how from a world class university. Further, small groups offer a strong knowledge growth and enhance team building.

With customized trainings for companies lifelong learning is settled. In addition, current scientific expertise in new technologies is taught in a practical way. This is implemented by means of didactics appropriate for adults.

Modern class rooms and living labs: Our further qualification programs combine theoretical and practical elements. It is crucial to guarantee a high level of planning security for all participants in order to ensure that the demanding further qualification is compatible with the demanding professional environment.

Best Practice Workflow for Your Transformation Project

**Basis**
e.g. a selected group of engineers will be trained in current scientific know-how on new technologies.

**Specialization**
e.g. 80% of your employees will get further insights to implement the transformation process.

**Experts**
e.g. the top 10% will gain additional knowledge in engineering and management topics to lead the digitalization process in the company.
Certificate Courses

Compact Part-Time Education Formats
In compact 3- to 5-day seminars, professionals get updated with technology expertise directly derived from the latest KIT research. On a high academic level and yet practically oriented, the Certificate Courses qualify engineering professionals in current technology issues. The seminars are offered in four highly topical fields of technology.

International Certificate Courses
In order to provide first-hand insights into specific technological environments and to foster intercultural exchange, the Certificate Courses are not only offered in Germany, but also at various international locations (e.g. in Suzhou/China).

Organized in cooperation with partner institutions worldwide, HECTOR School equips engineers with high-level special expertise. Current research know-how is conveyed to the participants by using a smart combination of lectures and case studies, either on- or off-site.

Exemplary Fields of the Certificate Courses:

Industry 4.0
- Smart Manufacturing & Automation with Industry 4.0
- Quality & Supplier Management in China
- Systems & Software Engineering

Digitalization
- Internet of Things: Modern Network Infrastructures
- Information & Knowledge Management
- Digitalization of Service Systems
- Data Science

Mobility
- Technology of Hybrid & Electronic Vehicles
- Digital Signal Processing
- Integrated Photonics
- Charging & Energy Management

Energy
- Renewables Generation & Grid Integration
- Battery Technology

The indicated courses serve as examples. The HECTOR School also offers customized seminars upon request and regularly updates the range of courses.

Key Facts: Certificate Courses

Program Structure
3- to 5-day seminars, max. 15 participants

Admission Requirements
An academic degree (e.g. bachelor, master, or diploma) and > 5 years of relevant work experience recommended

Academic Degree
Certificate from the Karlsruhe Institute of Technology (KIT), correlation: 1-3 ECTS
The "ProTalent" project aims to establish practice-oriented integrated education programs according to "German Engineering" standards in China. Application-oriented further education modules take place in the field of Industry 4.0 as well as in the fields of corporate social responsibility, environmental protection and occupational safety.

Leadership 4.0 Program

Interactive Workshop to achieve industry 4.0 technology competencies in the production environment & learn about complementary management methods and organizational models.

The Digital Transformation is one of the most challenging developments for the industry these days. Participants of the Leadership 4.0 program will gain hands on experience in a real world Industry 4.0 production line and enlarged knowledge about Industry 4.0 technologies and appropriate leadership styles.

Exemplary Schedule of the 2,5 days Leadership 4.0 Program

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<tr>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
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<tbody>
<tr>
<td>Potential/Risks of Industry 4.0</td>
<td>Theory and Implementation: Communication, Transparency, Structure, Agility</td>
<td>Organization and Management</td>
</tr>
<tr>
<td>Active Operation: Industry 4.0 Technologies</td>
<td>Reflection</td>
<td>Leading through Transition</td>
</tr>
<tr>
<td>Executive Talk</td>
<td></td>
<td>Initiating a Leadership project in your Company</td>
</tr>
</tbody>
</table>
MBA Fundamentals Program

The compact MBA program provides an ideal vehicle for providing management expertise and skills in a range of areas. The six units, each lasting five days, set current management issues in the context of present research and relate them to accepted business practices and solutions.

Participants of this program are graduates with a Master or PhD degree in engineering or natural sciences or have business experience (e.g. either in specific fields of engineering, in R&D or development departments in the industry), and have started their careers.

In the six units of the MBA Fundamentals Program, participants cover courses in e.g. finance, entrepreneurship, and marketing. The units are designed to be taken parallel to the job. And for those who want to go further, the credit points for the MBA Fundamentals Program can be recognized internationally within full MBA programs.

Schedule of MBA Fundamentals Program 2020

- **Projects Unit 1**: 3 ECTS - International Project Management
- **Values Unit 2**: 3 ECTS - Financial Accounting
- **Markets Unit 3**: 3 ECTS - Fundamentals of Finance
- **People Unit 4**: 3 ECTS - Business Ethics
- **Information Unit 5**: 3 ECTS - Marketing
- **Operations Unit 6**: 3 ECTS - Business Strategy or Decision Analysis
- **Optional**: 3 ECTS - Entrepreneurship
- **Total ECTS: 18**

* These courses are not mandatory for the completion of the certificate and do not grant credits. However, participation is strongly advised when completing the full program.

Key Facts: MBA Fundamentals Program

**Program Structure**
Part-time with 6 units, 5 days each, taught in English

**Admission Requirements**
Future executives with an engineering background, Master/ PhD Degree

**Academic Degree**
Certificate from the Karlsruhe Institute of Technology (KIT), correlation: 18 ECTS (recognized in international MBA programs)
Our team is looking forward to help you.