

Information Systems Engineering & Management

Executive Master's Program

**Digital Transformation of Products,
Services, and Organizations**



Become a HECTOR School Master

Leadership Know-How for Demanding Careers



»Studying at the HECTOR School was exactly the right decision. Besides the studies themselves, the network makes the HECTOR School unique. Through the studies, new friendships have formed and even years later you have the opportunity to be connected through the alumni program and always meet new, exciting people. In the meanwhile, my co-workers are studying at the HECTOR School.«

Britta Daffner

Alumna of Intake 2014



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

Oliver Gündling

Alumnus of Intake 2005

Voices



More Alumni

Executive Master's Program

Information Systems Engineering & Management

**MARKETING & DATA IT SAFETY & SECURITY AUTONOMOUS ROBOTICS
AGILE & SELF-ORGANIZING NETWORKS DECISIONS & RISK
SERVICE SYSTEMS CLOUD ENGINEERING IOT & INDUSTRY
4.0 PRESCRIPTIVE ANALYTICS FINANCE & VALUE MOBILE
BUSINESS & COMMUNICATION BIG DATA ARTIFICIAL INTELLIGENCE
DIGITALIZATION STRATEGY & PEOPLE INNOVATION & PROJECTS
MACHINE LEARNING DISTRIBUTED SYSTEMS SERVICE ENGINEERING**

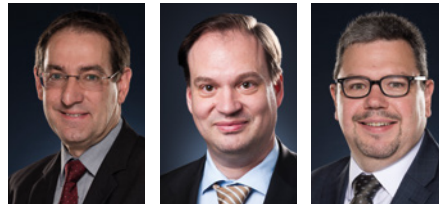


During the last decades, we witnessed a growing importance of information technology (IT) in business and society alongside increasing speed of innovation cycles. IT has become core for businesses from an operational company-internal and external customer perspective. Today, companies have to rethink their way of doing business. Digital products and services will characterize tomorrow's world and organizations are digitally transformed across all functional areas. Capturing the emerging opportunities requires globally thinking visionaries and managers, who are able to combine profound competence in information technology with excellent know-how in management.

The Master's program Information Systems Engineering & Management (ISEM) qualifies graduates to drive digital transformation of products, services, and organizations from a business and IT perspective. Graduates encounter digitalization challenges with an engineering orientation and solve them with the help of modern management methods.

They are also in a position to make efficient and effective use of information technologies within organizations following a socio-technical paradigm. Competitive and innovative digital products and services are developed and optimized to successfully accompany and direct digital changes in organizations and business networks. The program empowers graduates to apply an interdisciplinary approach to problems and trains adequate solution with a systems-oriented mindset.

Program Directors



Prof. Dr. Andreas Oberweis

Institute of Applied Informatics & Formal Description Methods, KIT

Prof. Dr. Ralf Reussner

Institute for Program Structures and Data Organization, KIT

Prof. Dr. Martin E. Ruckes

Institute of Finance, Banking, and Insurance, KIT

From an engineering perspective, graduates understand the role and potential of digital platforms from an enterprise and market point of view including state-of-the-art technologies such as Internet-of-Things and Blockchain.

They know modern software and system engineering techniques with a specific emphasis on the cloud computing paradigm. ISEM graduates can design and optimize business processes following a top-down and bottom-up approach. They also know how to transform (big) data to actionable knowledge following an engineering approach.

These competencies are enriched with security and privacy engineering concepts and technologies complemented with real-world cases on critical infrastructure management. Finally, ISEM graduates can specialize in digital services or autonomous robotics. In the respective specialization modules, they collect deep knowledge in one of the two fields.

In addition to the engineering expertise, ISEM graduates share five management modules with other master programs at Hector School. This fosters interdisciplinary networking across industries and provides the participants with state-of-the-art business knowledge in strategy, finance, accounting, marketing, innovation management, project management, decision and risk management and human resource management. Therefore, they can consider the commercial implications of technology-centric decisions and develop a holistic view on business and IT.

Engineering Modules (EM)

Digital Transformation of Products, Services, and Organization



»Digitalization enables new business models, creates new service opportunities and redefines existing products. All of that is done through software implemented innovation. This transforms our economy towards software realized added values in an unprecedented way. Hence, the capabilities of efficiently developing high quality software are becoming crucial for nearly for all enterprises. In our Master’s program Information Systems Engineering and Management accordingly we concentrate on software engineering, software quality, in particular security, cloud service engineering and AI technologies.«

Prof. Dr. Ralf Reussner, Program Director ISEM

EM 1: Digital Platforms

The module enables participants to understand and design digital platforms for organizations and markets in order to drive internal and external digitalization. The module first introduces state-of-the-art Enterprise System platform architectures and concepts covering a process-, information-, and people-centric perspective. Furthermore, participants understand trade-offs between standardization and flexibility and know how to leverage digital platforms in organizations in order to find a good balance. Complementing the organizational perspective, market engineering puts an emphasis on the design of information-centric markets and services in order to realize new digital business models. Finally, this module also introduce key concepts and technologies of the Internet of Things (IoT) as an enabler for realizing contemporary digital platforms.

EM 2: Software Engineering

This module focuses on two important aspects: first, the fundamental principles, methods and tools behind state-of-the-art software & systems engineering are introduced, and second principles for advanced Web applications as well as cloud computing concepts and technologies are explained. In a first step, the participants obtain a detailed overview of the stages of software systems development and they are qualified to apply the required methods and tools in the development process. Both, the well-established software systems development lifecycle as well as the agile software development approach will be introduced and discussed. Current modeling and programming languages e.g., HTTP, SOAP or WSDL, explain the architecture of Web applications. The participants will learn how advanced Web applications need to be engineering on this basis. Finally, cloud computing concepts and technologies taught within the module enable the participants to assess the opportunities and challenges of web-scale service applications.

EM 3: Process & Knowledge Engineering

In organizations, processes and knowledge are known to be closely linked to one another. In this module, the participants gain the ability to effectively and efficiently adapt the particular demands of business processes following an engineering approach leveraging appropriate methods and tools. Furthermore, participants learn methods and tools of process mining that follows a data-driven approach for process analysis and optimization. Understanding the need for data & knowledge engineering in businesses, participants of this module are also able to implement concepts for the modeling, representation, and management of data and knowledge. Finally, with the rise of Big Data participants acquire the necessary skills to implement and manage large-scale Big data solutions.

| | | |
|--------------|--|---|
| EM 1 | Digital Platforms | |
| | Courses: Enterprise Systems, IoT Technologies & Platforms, Platform and Market Engineering | |
| EM 2 | Software Engineering | |
| | Courses: Software & Systems Engineering, Advanced Web Applications, Cloud Computing | |
| EM 3 | Process & Knowledge Engineering | |
| | Courses: Business Process Engineering, Process Mining, Data & Knowledge Engineering, Big Data Management | |
| EM 4 | Security & Privacy Engineering | |
| | Courses: Information Security, Applied Cryptography, Network Security, Data Protection Regulations, Emerging Technologies & Critical Information Infrastructures | |
| EM 5 | Specialization Digital Services | Specialization Autonomous Robotics |
| | Courses: Service Innovation, Service Design Thinking, Digital Service Business Models & Transformation, Artificial Intelligence in Service Systems | Courses: Autonomous Robotics Lab |
| Crash Course | Probability and Statistics | |
| | We highly recommend all applicants to participate in the course to update the technical knowledge, as it might be the crucial factor for a successful degree at the HECTOR School. | |

Curriculum may be subject to change.

Master the Digital Transformation and Bridge the Gap Between IT and Business

EM 4: Security & Privacy Engineering

Today's information systems are required more than ever to guarantee security and privacy. This module enables participants to acquire the necessary knowledge to systematically engineer security and privacy in information systems. This module first introduces information security to prevent, detect, document and counter threats to information. Second, key concepts of applied cryptography are introduced. Legal aspects play a critical role in security & privacy engineering. Therefore, the fundamental legal concepts of data protection regulation are explained. Complementing the security perspective, information privacy and privacy enhancing technologies are discussed. The module is complemented with a specific emphasis on critical infrastructures and the role security & privacy engineering plays in these infrastructures.



EM 5: Specialization Digital Services

Services already account for more than 60% of the gross value added of developed economies. Even product companies try to increasingly tap into the application processes of their customers ("servitization"); thus, comprehensive knowledge on how to strategically use, design, engineer, and manage services are key. Current trends, like Digital nature, Data & analytics and System & platform perspectives make the familiarity with digital services a must for any future leader.

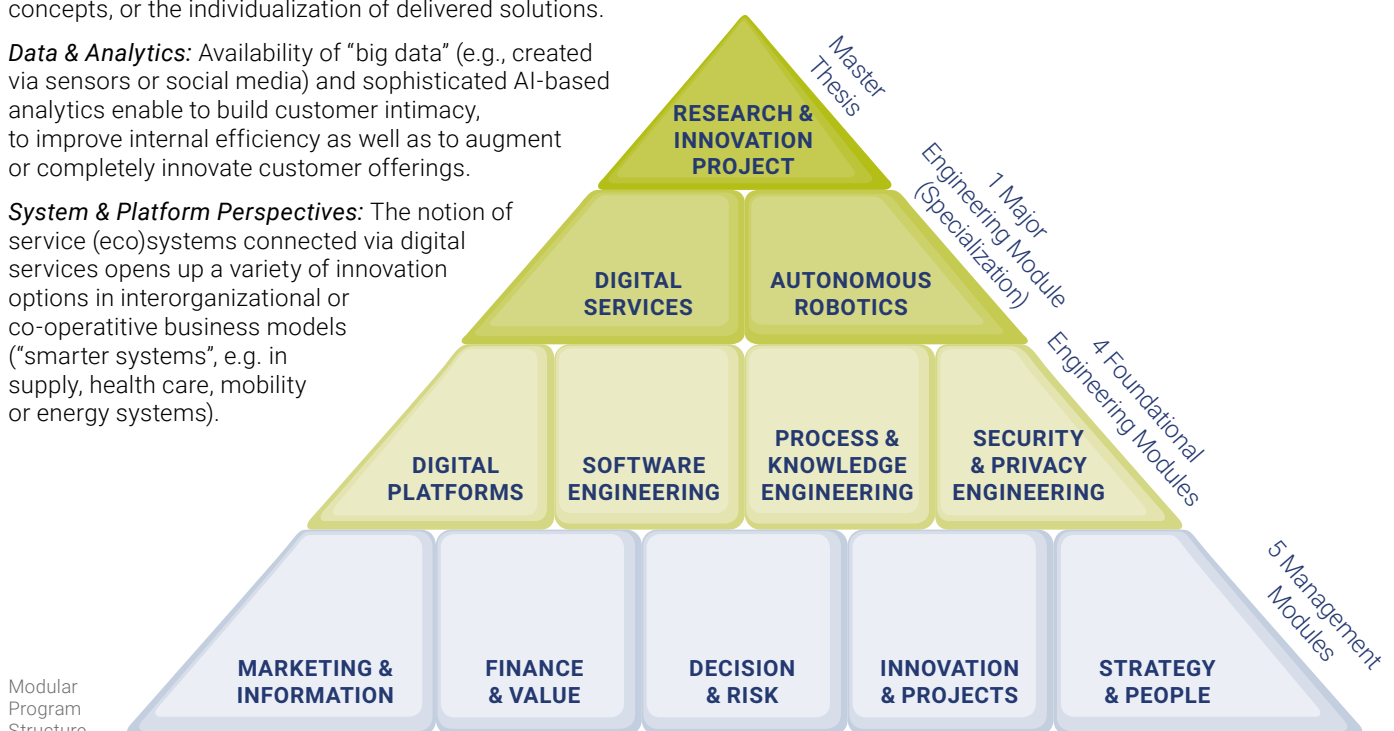
Digital Nature: Digital creation and delivery of these services trigger a number of options like immediate globalization capabilities, agile development and deployment (DevOps), simple inclusion of open innovation concepts, or the individualization of delivered solutions.

Data & Analytics: Availability of "big data" (e.g., created via sensors or social media) and sophisticated AI-based analytics enable to build customer intimacy, to improve internal efficiency as well as to augment or completely innovate customer offerings.

System & Platform Perspectives: The notion of service (eco)systems connected via digital services opens up a variety of innovation options in interorganizational or co-operative business models ("smarter systems", e.g. in supply, health care, mobility or energy systems).

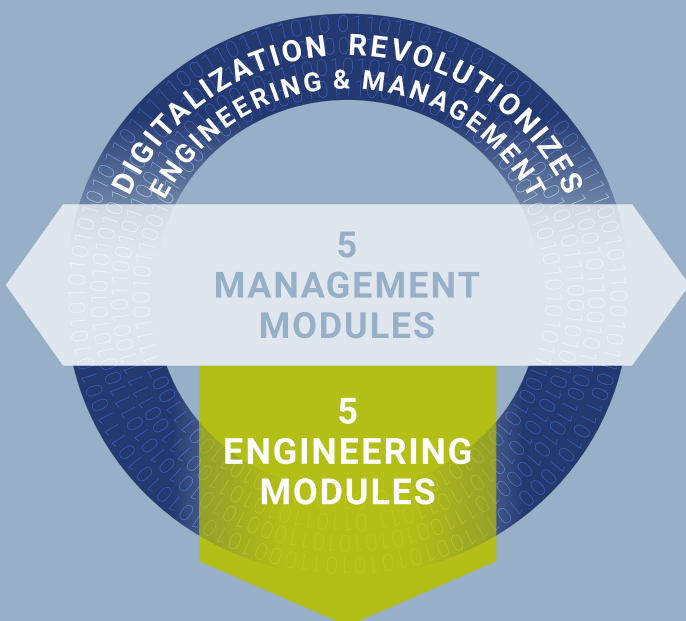
EM 5: Specialization Autonomous Robotics

The Specialization „Autonomous Robotics“ will introduce you to the possibilities and challenges of designing, creating, and controlling autonomous robots in a production or logistics context. Working in teams in a lab, you will be introduced to the fundamental concepts of autonomous control in robotics. At the same time, you will be working on a task, which requires collaborating robots. Successively over the period of the module, you will be spending more time working in your team. Finally, you will connect your devices with those developed by other teams to jointly solve a task.



Management Modules (MM)

Economic Know-How for Successful Managers



| | |
|-------------|--|
| MM 1 | Marketing & Information |
| Courses | Data Driven Marketing, Information Systems Management, Big Data Methods, Legal Aspects of Information |
| MM 2 | Finance & Value |
| Courses | Management Accounting, Sustainability, Strategic Financial Management, Case Studies |
| MM 3 | Decisions & Risk |
| Courses | Decision Modeling (+Computer Tutorials), Risk Aware Decisions (+Case Studies+Finance), Interactive Decisions, Robust and Stochastic Optimization |
| MM 4 | Innovation & Projects |
| Courses | Technology Driven Innovation, International Intellectual Property Law, Project Management, Multi-Project Management in an International Setting |
| MM 5 | Strategy & People |
| Courses | Strategic Management, Managerial Economics, Business Organization and Corporate Law, Strategic Human Resource Management, Leadership and Conflict Management |

Curriculum may be subject to change.

Big Picture Management Modules

Management is becoming increasingly complex and networked in data-driven companies (INFORMATION). Therefore, engineers and managers must obtain a holistic understanding of all corporate divisions to be able to make complex decisions (DECISIONS & RISK), see innovation as an integrated system (CORPORATE INNOVATION & INTRAPRENEURSHIP) from the perspective of the market (MARKETING), the employees (STRATEGY & PEOPLE), and the company (FINANCE & VALUE).

All Master's Programs share five management modules conveying the latest theories and methods in management. 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.

MM 1: Marketing & Information

Many of today's most successful businesses excel in satisfying customer needs because their decisions are based on data instead of good feeling. This is what this module is about: One focus is on how to use data for designing customer solutions (and get paid according to their value) and the other focus is a more general one at issues surrounding the use of (big) data for business decision-making.

MM 2: Finance & Value

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

MM 3: Decisions & Risk

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

MM 4: Innovation & Projects

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

MM 5: Strategy & People

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



»It was important for me to concentrate 100% on practice and my studies. Thanks to the block phases offered by the HECTOR School, I can be fully involved in both the project and the university. In terms of content, I like the general insight into all the important management methods of a company and the insight into relevant tech solutions on the market.«

Samantha Butz

Alumna of Intake 2018



Technology & Management Know-How

Quality Made by the Karlsruhe Institute of Technology (KIT)

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

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

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

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

Portrait of the



HECTOR School



Employability Ranking 2022



Germany
Europe
Worldwide

Executive Education @HECTOR School

Technology Transfer & Innovation

from the internationally renowned university - the KIT.

Power of Networks

benefit from a comprehensive professional network of academics and industry partners worldwide.

Part-Time Programs

allow for simultaneous work and study for participants and their companies.

Management & Engineering

combined makes our programs unique

and ensures long term sustainability and competitiveness.

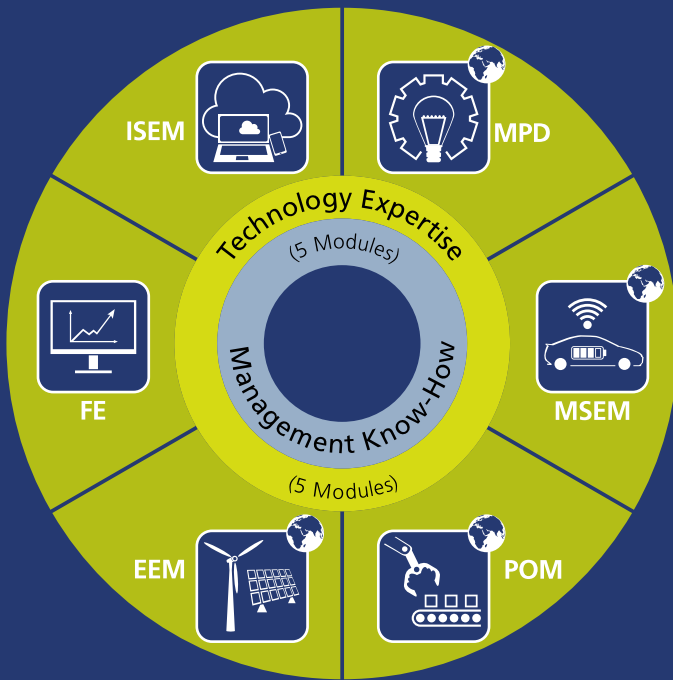
4 REASONS

for the Technology Business School of the KIT




Executive Master of Science Programs

Cutting Edge Technology Combined with the Latest Management Expertise



- EEM** Energy Engineering & Management
- FE** Financial Engineering
- ISEM** Information Systems Engineering & Management
- MPD** Management of Product Development
- MSEM** Mobility Systems Engineering & Management
- POM** Production & Operations Management

 = including module at another international location

Key Facts

Part-Time Master’s Program, English-Taught, Duration of 20 Months

Academic Degree

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

Accreditation

The KIT is system-accredited by AAQ.



All HECTOR School Master’s Programs are accredited by the internal quality assurance system of 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.

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 Calendar

Job-Compatible Format and an Ideal Work-Study Balance

| September 2024 | | | | | | | October 2024 | | | | | | | November 2024 | | | | | | | December 2024 | | | | | | | | |
|----------------|-----|-----|-----|-----|-----|-----|---------------|-----|-----|-----|-----|-----|-----|---------------|-----|-----|-----|-----|-----|-----|---------------|-----|-----|-----|-----|-----|-----|----|----|
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| 02 | 03 | 04 | 05 | 06 | 07 | 08 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | | |
| 09 | 10 | 11 | 12 | 13 | 14 | 15 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | EM1 | 12 | 13 | 14 | 15 | 16 | 17 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | | |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 | 28 | 29 | 30 | 31 | 25 | 26 | 27 | 28 | 29 | 30 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | | | | | | |
| MM1 | | | | | | | | | | | | | | | | | | | | | | 30 | 31 | | | | | | |
| January 2025 | | | | | | | February 2025 | | | | | | | March 2025 | | | | | | | April 2025 | | | | | | | | |
| 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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| 06 | 07 | 08 | 09 | 10 | 11 | 12 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | | |
| MM2 | 14 | 15 | 16 | 17 | 18 | 19 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | | |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | EM2 | 18 | 19 | 20 | 21 | 22 | 23 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | | |
| 27 | 28 | 29 | 30 | 31 | 24 | 25 | 26 | 27 | 28 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 28 | 29 | 30 | | | | | | | | | | |
| | | | | | | | | | | | | | | MM3 | | | | | | | | | | | | | | | |
| May 2025 | | | | | | | June 2025 | | | | | | | July 2025 | | | | | | | August 2025 | | | | | | | | |
| 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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| 05 | 06 | 07 | 08 | 09 | 10 | 11 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | | |
| EM3 | 13 | 14 | 15 | 16 | 17 | 18 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | EM4 | 15 | 16 | 17 | 18 | 19 | 20 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | | |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | | |
| 26 | 27 | 28 | 29 | 30 | 31 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 28 | 29 | 30 | 31 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | | | | | | |
| | | | | | | | 30 | | | | | | | | | | | | | | | | | | | | | | |
| September 2025 | | | | | | | October 2025 | | | | | | | November 2025 | | | | | | | December 2025 | | | | | | | | |
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| 01 | 02 | 03 | 04 | 05 | 06 | 07 | | | 01 | 02 | 03 | 04 | 05 | | | | | | 01 | 02 | MM5 | 02 | 03 | 04 | 05 | 06 | 07 | | |
| MM4 | 09 | 10 | 11 | 12 | 13 | 14 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | | |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | | |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 | EM5 | 21 | 22 | 23 | 24 | 25 | 26 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | | |
| 29 | 30 | 27 | 28 | 29 | 30 | 31 | | | | | | | | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 29 | 30 | 31 | | | | | | |

- Welcome Event
- MM Management Modules
- EM Engineering Modules
- Exams

Please note: Dates are subject to change.

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**:
- >> 9 months project work **MPD, POM, MSEM, EEM**
 - >> 6 months project work **ISEM, FE**

Intake
2024

Our Programs

More About



Course Guide Book

Order Your Free



Timetable

Download



HECTOR SCHOOL

OF ENGINEERING & MANAGEMENT

Do you have questions? We are looking forward to assisting you.



International Department of the Karlsruhe Institute of Technology (KIT) gGmbH

Schlossplatz 19 | 76131 Karlsruhe/Germany

Phone +49 (0)721-608 47880

Fax +49 (0)721-608 47882

E-mail info@hectorschool.kit.edu

Web www.hectorschool.kit.edu

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our
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