



Management of Product Development

Executive Master's Program Agile Engineering of Mechatronic Systems



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Become a HECTOR School Master

Leadership Know-How for Demanding Careers



»Personally, the HECTOR Master Program was an excellence experience. The Management in Product Development Program provided me a comprehensive set of tools to master today's product development challenges. In addition, the course in business accounting and management expanded my knowledge for my daily professional work as Manager. The technical course delivered state-of-the-art-knowledge in technology and methodology, ready for use. Overall the Executive Master Program was great professional development training.«

Thomas Kiefer

Alumnus of Intake 2005



»HECTOR School provided me an opportunity to look outside the box. The experience helped me understand creating solutions does not always mean "doing it yourself" but also a fair deal of "learning from State of the Art". The Management of Product Development Program as such helped me immensely in my daily business and in my endeavor to combine Schaeffler culture of Product Development to Best Practices in Industry.«

Pulijala Vaibhav Rao

Alumnus of Intake 2015



Executive Master's Program

Management of Product Development

AGILE ENGINEERING & DESIGN
THINKING DIGITAL TWIN DESIGN
THINKING MULTICULTURAL AND
VIRTUAL TEAMS
ADVANCED SYSTEMS
ENGINEERING COLLABORATION
METHODS INTERDISCIPLINARY
DEVELOPMENT DIGITALIZATION
UX / UI / USER-CENTERED DESIGN
INNOVATION MANAGEMENT



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 into companies and is crucial for their success through innovation. Creativity and performance potential define the success of product development.

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.

Program Directors



Prof. Dr.-Ing. Dr. h. c. Albert Albers

Institute of Product Engineering, KIT



Prof. Dr. Martin E. Ruckes

Institute of Finance, Banking, and Insurance, KIT

Based on an integrated approach to product creation processes, the graduates can successfully implement innovative ideas and innovation in competitive products, while they draw a special focus on major criteria such as customized product solutions, the reduction of production costs as well as the optimization of quality standards. Furthermore, they are capable of implementing creativity techniques to accompany further innovation processes.

Additionally, due to increasing performance and competition pressure in product development, graduates can counteract shorter development times and product life cycles with appropriate methods and techniques.

Finally, Management of Product Development shares five management modules with the other master programs. This fosters networking across sectors and provides the participants with general knowledge in finance, accounting, marketing, international multi-project management, international law, and human resource management. In this way, they can consider the commercial implications of project decisions and develop a holistic view.



Shape the Future through Innovation



Case Study beginning with the analysis phase followed by the technical implementation and prototype construction resulting in the final presentation and transportation of cold beverages.

ABOUT THE CASE STUDIES

During their studies, we give participants the opportunity to directly implement what they have learned in a development project based on a given problem. During the course of the project, participants are accompanied by academic staff, so that they acquire the necessary knowledge about processes, methods, and tools in their project work. For example, analysis methods, universal problem-solving methods as well as verification and validation methods (DoE, XiL - X-in-the-Loop) are used. This teaching format characterizes an extremely practical education and optimally prepares the participants for their future tasks in companies.



»Product development is the driver of innovation. You learn to manage product development in an efficient, methodical, creative and success-oriented way in this master program. You become qualified to be the driving force for successful product innovation

in your company with the scientifically sound and practice-oriented training program for professionals.«

Prof. Dr.-Ing. Dr. h.c. Albert Albers

Program Director

EM 1: Integrated Product Development by ASD – Agile Systems Design

The key factor of successful product development is the systematic planning and use of adequate tools and methods depending on various situations. For example the application of the portfolio analysis, of mind mapping or Design Structure Matrices (DSM) is essential. ASD – Agile Systems Design supports the product developer across the entire product development process.

By a situation-oriented combination of structuring and agile elements, as well as the consistent integration of the model of PGE – Product Generation Engineering, the developer is able to develop products efficiently and effectively through continuous customer integration.

ASD – Agile Systems Design also supports the developer in continuous validation. The first prototypes are set up early in the process and continuously gain functionality and maturity through joint validation with the customer. In this way, the direction of development is secured at an early stage and late, expensive changes to the product are avoided. In addition, customers, users and provider benefits are systematically integrated in the form of product profiles.

ASD – Agile Systems Design structures development processes, follows nine integrated principles, integrates problem solving techniques and a methodological toolbox, through which current development methods are recommended according to the situation and needs of the development team. Participants realize the effect and impact of design modifications as well as the influence of prototypes or simulations on the innovation process.

In addition to that, an understanding of structures, standards, and modifications in CAX and VR systems is provided. Knowledge of the background of information technology is an absolute necessity.

Engineering Modules (EM)

State-of-the-Art Technology Expertise in Product Development Processes

EM 2: Design and Validation Process & Information Systems for Product Development (PD)

The module offers in-depth insight into the fundamentals of product development processes and its challenges. Individual process steps and the organization are defined. Moreover, the product lifecycle is implemented in the form of a Product Lifecycle Management (PLM) system.

When using virtual reality systems (e.g. CRM, ERP), it is important to identify both the opportunities and limits for this new technology. The participants identify workflows relevant to data modeling.

EM 3: Simulation and Target Values in PD

While the first two modules systematically explain and deepen knowledge of the principles of the product development process, this module focuses on further aspects for successful product development.

Crucial success factors in product development, such as Total Quality Management (TQM) and Total Cost of Ownership (TCO), are explained and illustrated by examples. Methods presented, such as FMEA (Failure Mode and Effects Analysis) and FTA (Failure Tree Analysis) as well as target costing, are efficient tools to support the product development process.

Using examples, the participants learn to structure and systematically manage the design process in teams. The participants are aware of the significance and limitations of modern interface technologies. They can assess and classify business strategies in terms of international competitiveness.

Furthermore, methods are presented for analyzing lightweight potentials in overall systems, design by multi-material as well as methods for synthesis and structural optimization of isotropic and anisotropic materials. The module also covers methods of validation in a Product Design Project (PDP) and specific environment simulations (e.g. FEM, BEM). The typical approach to planning and executing a simulation study is applied.

Project Work serves to acquire competence in the use of development methods. For this purpose, the development task is to be refined based on the market situation. Then, this definition is to be implemented in a product concept. Intuitive and discursive creativity techniques based on TRIZ-box or methods of cost control are used under close-to-reality conditions.

Based on this, all skills and theories learned are implemented in a practice-oriented environment. Product planning, product specification, and concept development processes are applied.

EM 1	Courses	Integrated Product Development by ASD – Agile Systems Design
		Mission and Vision in Product Development, Integrated Product Development*, Industrial Design Engineering Data Structures and Algorithms for Intelligent Engineering
EM 2	Courses	Design & Validation Process and Information Systems for Product Development (PD)
		Structured Problem Solving in Mechatronic System Development - SPALTEN*, Product Development Processes and Activities*, Patent Strategy in Industry, Introduction and Application to SysML, Lightweight Design, IoT Solutions for Product Lifecycle Management (PLM)
EM 3	Courses	Simulation and Target Values in PD
		Methods of Simulation; Target Costing, Virtual Twins & Immersive Environments, Project Work I: Conception*
EM 4	Courses	Validation and Verification in PD
		Project Work II: Realization*, Test Based Development, Systems Engineering, Eco-Design Methodology of Sustainability
EM 5	Courses	Tools and Methods of Product Engineering 
		Project Work III: 2DR Documentation, Reflection Theory, and Practice*, Quality Management, Supplier Management

Curriculum may be subject to change.

*Case Study

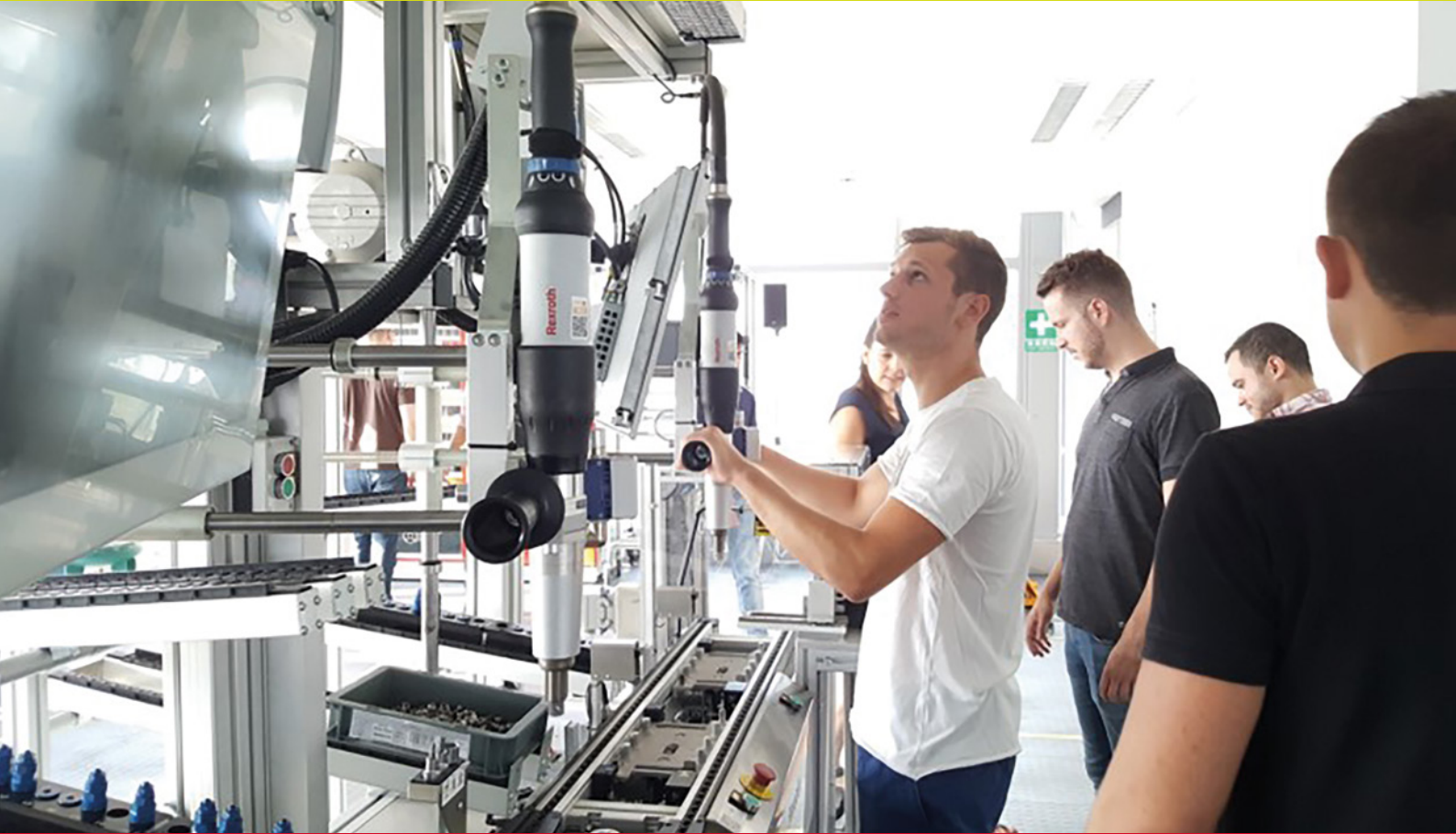
EM 4: Validation and Verification in PD

Systems engineering is an interdisciplinary approach to the early definition of customers' needs and functionalities, the documentation of system requirements to be developed, and the continuous synthesis and validation of the system during the development process.

A wide range of methodological aids is available to support the developer in systems synthesis and analysis. Eco-design methods are adequate tools to use ecological aspects as chances for product innovations. Methods and tools for prototyping, verification, and validation are introduced and used directly in the project work.

Engineering Modules (EM)

International Module in China



Global Education for Global Players

EM 5:

Tools and Methods of Product Engineering

Successful work on complex multi-technological systems requires work in interdisciplinary teams. Apart from the use of appropriate support methods, such as the V-model, understanding of the varying perspectives of the team members is required. This results in high requirements on the quality assurance of interdisciplinary product development processes. Basic principles are presented and made available in the form of a practical guide.

EM 5 is held at the KIT China Branch in Suzhou in cooperation with the Global Advanced Manufacturing Institute (GAMI). Many global companies not only have production but also development capacities in China. In order to adapt or develop their products for the local market a thorough understanding of the market as well as of potential cultural differences in the development team are crucial success factors.



Management Modules (MM)

Economic Know-How for Successful Managers

Big Picture Management Modules

Management is becoming increasingly important in data-driven organizations, while at the same time becoming more complex and interconnected. Engineers and managers need to have a holistic understanding of all areas of the business in order to make the right decisions. This also means that innovation must be viewed and experienced as an integrated system from the perspective of the market, the employees and the company. All of the HECTOR School's Master's programs therefore include five management modules in which the latest theories and methods are taught.

Participants from different industries and international locations can share their expertise, discuss current technological and business challenges from different perspectives, and build a sustainable network of peers.

MM 1: Marketing & Data Science

This module equips participants with the tools to harness data and technology for effective decision-making in marketing and business contexts. It covers techniques for analyzing and transforming data into actionable insights, managing information systems to bridge business and IT, and understanding the legal frameworks for data and privacy protection. Through practical case studies and applied learning, participants gain skills essential for thriving in today's data-driven, digital economy.

MM 2: Finance & Value

Modern corporate governance is based on value creation. This module empowers participants to navigate financial complexities and sustainability challenges. It covers cost analysis, decision-making, and planning tools for effective management while exploring the circular economy and key sustainability indicators. Participants also gain insights into investment valuation, capital budgeting, and corporate finance strategies. A hands-on group project enhances analytical and strategic skills, applying theoretical knowledge to real-world company valuations for informed decision-making.

MM 3: Decisions & Risk

Successful management requires making the right decisions. This module develops participants' ability to make informed decisions under uncertainty. It covers quantitative decision modeling, risk-aware strategies, and robust and stochastic optimization for managing in uncertain environments. Participants also gain a rigorous understanding of game theory and its applications in strategic interactions. Through practical computer tutorials and theoretical frameworks, the module equips participants to model, analyze, and optimize decisions in complex, interconnected systems with confidence and precision.

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

Curriculum may be subject to change.

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

In today's fast-paced business world, this module prepares participants to tackle strategic challenges while fostering employee engagement and creativity. Combining business strategy, corporate law, and HR development, the module addresses competitive advantage, corporate governance, and global teamwork. Participants explore leadership concepts, digital transformation, and incentive systems, applying evidence-based tools in case studies and practical exercises. Participants will be able to analyse and understand strategic corporate goals in dynamic markets from a human-centred perspective.



Technology & Management Know-How

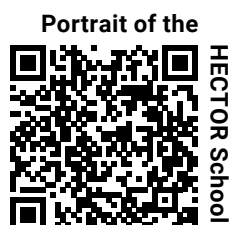
Quality Made by the Karlsruhe Institute of Technology (KIT)

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

The school's mission is to provide working professionals with state-of-the-art technological expertise and management know-how through part-time educational programs. The HECTOR School promotes lifelong learning within the industry. Participants are supported in their career development through executive master's degree programs, certificate courses, and customized partner programs.

The benefits of the executive master's programs are numerous, both for the participants and 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.



World University Ranking 2026

Worldwide
Standing
#98

Among
the best
7%

Ranking
in Germany
#5

Ranking
in Europe
#59

Executive Education @HECTOR School

Technology Transfer & Innovation

from the internationally renowned university - the KIT.

Power of Networks

benefit from a comprehensive professional network of academemics 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.

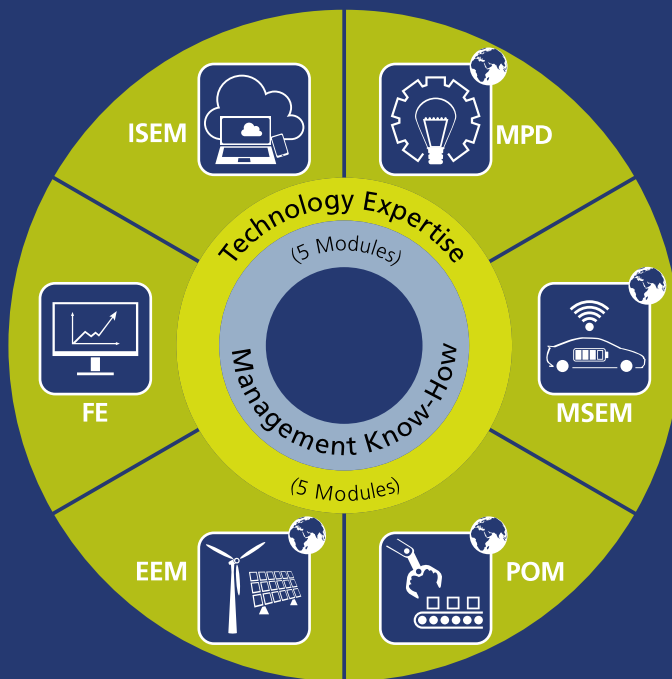
REASONS

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 2025							October 2025							November 2025							December 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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January 2026							February 2026							March 2026							April 2026						
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MM2	13	14	15	16	17	18	09	10	11	12	13	14	15	09	10	11	12	13	14	15	MM3	14	15	16	17	18	19
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May 2026							June 2026							July 2026							August 2026						
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September 2026							October 2026							November 2026							December 2026							
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MM4	15	16	17	18	19	20	12	13	14	15	16	17	18	09	10	11	12	13	14	15	14	15	16	17	18	19	20	
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28	29	30					EM5	27	28	29	30	31		23	24	25	26	27	28	29	28	29	30	31				

	Welcome Event
	Management Modules
	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
2025

Our Programs



Course Guide Book



Timetable



HECTOR SCHOOL

OF ENGINEERING & MANAGEMENT

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



Judith Elsner
Managing Director



Marco Lanza
Head of Business Development and
Communications



Stefan Franck
Team Leader Operations



Martina Waldner
Senior Program Consultant



Yaxian Liu
Program Consultant



Song Utz
International Recruiting and
Relations Manager



Hanna Meinzer
Manager Operations Master's Thesis



Lea Skiljo
Manager Operations



Stine Ullum
Manager Operations



Janina Guptill
Marketing Manager



Jelena Parassidis
Marketing Manager



Katrin Olböter
Manager Recruitment and
Admissions



Jolana Lang
Sales Assistant



Temir Vinokhodov
Junior Program Consultant



Celine Decker
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More about



**our
Services**

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