Executive Master Program
Production & Operations Management

Technology + Management
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 the SAP AG.

The school envisions 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 in part-time education formats. With Executive Master Programs, the HECTOR School fosters lifelong learning. The benefits of the executive master programs are manifold, for participants as well as for their companies:

- **Unique holistic approach**: combination of technology expertise with management know-how
- **Direct transfer of state-of-the-art knowledge**: from research of the Karlsruhe Institute of Technology (KIT)
- **Part-time structure**: allows participants to continue with demanding careers whilst acquiring new skills
- **The master thesis provides an excellent opportunity to set up innovation projects**: companies gain outstanding added value through the consultation of such projects by professors from KIT
- **Excellent network opportunities**: professional networking is fostered across industries and on an international scale

The school envisions 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.

The benefits of the executive master programs are manifold, for participants as well as for their companies:

- **Unique holistic approach**: combination of technology expertise with management know-how
- **Direct transfer of state-of-the-art knowledge**: from research of the Karlsruhe Institute of Technology (KIT)
- **Part-time structure**: allows participants to continue with demanding careers whilst acquiring new skills
- **The master thesis provides an excellent opportunity to set up innovation projects**: companies gain outstanding added value through the consultation of such projects by professors from KIT
- **Excellent network opportunities**: professional networking is fostered across industries and on an international scale

Production technology and supply chain topics shape the future of the manufacturing industry. Major developments in the context of Industry 4.0 require highly qualified engineers with comprehensive knowledge of state-of-the-art technology and methods to successfully realize innovative concepts. Only a multidisciplinary approach can meet the requirements of today’s interconnected flow of data, products, and money in production and logistics.

Graduates of the Master Program Production & Operations Management (POM) are able to analyze and optimize the efficiency of value-added processes within the operation of production and service systems. They can understand and analyze service and production processes, capture and formally describe requirements, frame boundary conditions and targets and achieve a targeted improvement by means of the skills they acquired in the Master Program concerning production management with special focus on production processes, information technology, logistics and human resources as well as on the technical methods and tools required.

In addition, graduates can identify the possibilities and limitations of formal methods and models as well as the challenges that represent the transmission between the modeled world and reality and handle them in a solution-driven way. Given that nowadays in production and logistics the flow of data, products and money are closely interconnected, graduates are able to solve problems taking into account these tree factors and multi-disciplinary solution approaches.

On top the master program shares five management modules with the other master programs. This fosters the network across industries and provides the participants with general knowledge in finance, accounting, marketing, international multiproject management, international law, and human resource management. By this they can consider the commercial implications of project decisions and develop a holistic view.

The graduates are familiar with state-of-the-art concepts and methods and are able to apply those problem-oriented and further them. Methods and techniques in conjunction with decision making are especially focused on in Operations Management.

In addition, graduates can identify the possibilities and limitations of formal methods and models as well as the challenges that represent the transmission between the modeled world and reality and handle them in a solution-driven way. Given that nowadays in production and logistics the flow of data, products and money are closely interconnected, graduates are able to solve problems taking into account these tree factors and multi-disciplinary solution approaches.

On top the master program shares five management modules with the other master programs. This fosters the network across industries and provides the participants with general knowledge in finance, accounting, marketing, international multiproject management, international law, and human resource management. By this they can consider the commercial implications of project decisions and develop a holistic view.

The graduates are familiar with state-of-the-art concepts and methods and are able to apply those problem-oriented and further them. Methods and techniques in conjunction with decision making are especially focused on in Operations Management.
EM 1: Fundamentals in Production & Operations Mgmt

Industrial management and engineering is of holistic character. So far, industrial engineering has been aimed at integrating man, material, equipment, and funds in production systems. Now, activities also focus on the IT and technology infrastructure to control complex systems. Hence, the industrial engineer concept was enlarged from an ‘efficiency expert’ and ‘productivity expert’ by the concept of a ‘knowledge worker’.

Today, industrial engineering also deals with the development, optimization, installation, and management of holistic systems, consisting of man, materials, and infrastructure, for any type of production or service. This module enables graduates to understand all necessary concepts and underlying methods of industrial management. It focuses on deterministic and stochastic operations research which is of great help for the planning process of logistic systems (modeling, simulation, etc.) and IT concepts and tools which accompany the product life cycle management process at the interface of product development and production.

EM 2: Support of Production Systems

IT support of production systems is an essential part in state of the art production systems. E.g., virtual engineering is the early, continuous, integrated support of the development process as regards to the adjustment, evaluation, and concreteness of the development results from all partners with the help of virtual prototypes.

Modern production and logistic systems strongly depend on an appropriate IT support during the complete lifecycle. For this reason, this module focuses on understanding, generating, and analyzing models from various domains. On this basis, evaluation and optimization methods are applied to new problems and extended. Methodological competences are combined with scientific work in the areas of product lifecycle management, simulation, and optimization.

EM 3: Methods of Operations Management

The ever-growing integration and globalization of production structures lead to an increasing importance of logistics for cost and performance development in operations networks. The design phase of products and processes is followed by the operations phase. Consequently, module EM3 focuses on the further development of the corresponding skills and competences in this field.

Participants are to enhance their knowledge in order to be able to understand production and supply chain management taking into account human resources.

At the same time, mapping of the physical world onto the world of controlling has to be understood. On this basis, this module concentrates on applying the lessons learned as well as on the further development of the methodology and its integration in the teamwork at the production company.

EM 4: Networks of Supply & Production Systems

Today’s competitive environment regarding supply chains has dramatically changed. Emerging economies such as China have become key players and have changed the view on modern network systems. Supply Chain Management plays a key role in Production & Operations Management. Having understood the individual objects in the added value chain, these have to be combined in the supply chain. This includes the internationalization of processes of values added, their distribution to physical and dispositive processes as well as methods for their planning and control.

For this purpose, new models have to be generated and existing models need to be further developed and adapted. Multidisciplinary analysis of the production logistics point of view and its mathematical modeling are of particular significance. In this way, the participants can derive profound statements relating to the performance of novel network structures.

EM 5: Global Production & Distribution

Made in China is becoming more and more important for global acting companies. In 1990, China produced less than 3% of global manufacturing output by value; nowadays its share is nearly a quarter. The white heat of China’s ascent formed supply chains which reach deep into South-East Asia. Global players therefore continually extend their production sites in China. At the same time, the demand for engineers with highly developed technological know-how and the ability to meet the different on-site requirements is rapidly growing.

Due to this the final engineering module takes place in Suzhou/ China (close to Shanghai) in cooperation with GAMi in AMTC. It is composed of compact knowledge transfer in lectures, case studies as well as excursions and company tours. The latter will provide participants with profound insights into the practical implementations in a Chinese production environment. The module does not only provide state-of-the-art knowledge transfer on-site, but also allows useful exchange with professionals and executives working in China.
Management Modules (MM)

Fundamental economic know-how for successful managers

MM 1: International Project Management

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 and Gantt charts, heuristic solution procedures and rescheduling. Modelling, planning and scheduling, which arise in a great variety of practical situations, are also emphasized.

MM 2: Finance for Executives

Finance for Executives provides participants with an understanding of the key financial statements and its underlying accounting principles. The course gives an overview of investment rules and financial decisions.

MM 3: Business Strategy, Marketing & Controlling

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, formulation and evaluation based on competitive advantage, and portfolio strategy. In addition to these concepts approaches of modern marketing that show a strong reference to business strategy are presented.

MM 4: Human Resource Management

Human Resource Management 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 & Contracts

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

The academic calendar for each program starting annually in March 2010 consists of 10 intensive modules, each with a duration of 10 days. At the end, all programs conclude with a Master Thesis.

Curriculum may be subject to change.
More Master Programs.

Seven Part-time Master Programs

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

Next to the master programs, HECTOR School also offers certificate courses (3 - 5 day seminars on state-of-the-art technology topics) and partner programs.

HECTOR School of Engineering & Management
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.com
Web    www.hectorschool.com

Imprint
Publisher: Marketing Department HECTOR School of Engineering & Management
Edition: 1/2016
Photos: International Department gGmbH, fotolia.com, Karlsruhe Institute of Technology (KIT), Barcodes generated with TEC-IT Barcode Software