Executive Master Program
Financial Engineering

Technology + Management
The benefits of the executive master programs are manifold, development of its graduates. Approaches of its industry partners and the executive programs, the HECTOR School fosters lifelong learning. The school envisions to provide professionals with state-of-the-art technology 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

**Key Facts part-time Master of Science (M.Sc.) Programs**

**Program Structure**
- Part-time, 10 x 2-week modules
- Duration: Part-time lecture period of ~15 months
- Master Thesis: Project work in the company, 6 months
- 5 Engineering and 5 Management Modules
- Teaching language: English
- Yearly program start in October

**Academic Degree**
Master of Science (M.Sc.) from the KIT (90 ECTS)

**Admission Requirements**
- An academic degree: e.g. Bachelor, Master, or Diploma
- 1-2 years work experience (depending on the first degree's level; recommended > 3 years)
- TOEFL score of at least 230 or 90 iBT

**Accreditation**
All M.Sc. programs are accredited by ASIN. ASIN was acknowledged as the first European continental accreditation agency by the Washington Accord (W.A.) in 2003.

**Assessing and controlling different types of risks** are key responsibilities in companies as well as in the financial sector. The quality of risk management processes is a crucial factor in the success or failure of the business. Increasingly complex financial products, various regulations and the enormous importance of information technology have created a great challenge both to financial and non-financial companies. Mastering these challenges requires a thorough understanding of complex financial strategies, financial modeling ability, computational proficiency, and managerial vision.

In response to this demand, our master program in Financial Engineering offers a unique combination of familiarity to finance theory, engineering methods, management tools, mathematical and computational techniques. With its long tradition of interdisciplinary programs, the Karlsruhe Institute of Technology (KIT) provides an ideal interdisciplinary environment. Building on the long-established reputation for excellence in business engineering, the two-part program combines an in-depth knowledge and understanding of fundamental concepts in business, finance, and management, with the latest developments in financial engineering.

With the pace of financial innovation, the need for highly qualified people trained in financial engineering also increases. A demanding career in a financial company such as an investment or commercial bank, or in corporate finance departments of companies would be an ideal place to work, with the abilities attained in the program. The techniques are to the utmost benefit for all candidates, since the material covered is well applicable to corporate finance and corporate risk management.

On top the Financial Engineering shares five management modules with the other master programs. This fosters the network across branches 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.
EM 1: Information & Service Management

Nowadays service markets are characterized by a strong interrelation with information service management due to the original set-up of service markets. The overall objective of the module is to offer participants an understanding of market engineering and an emphasis on the design and thus get an idea of among other things, innovation diffusion. Innovation driver analyses make participants systematically identify the difference between invention and innovation.

Since the structure of information markets is discussed participants are able to develop an understanding for the action of market actors. In addition, consideration of service competition as a business strategy helps participants structure the impacts of service competition on the design of businesses, markets, products, processes, and services.

EM 2: Global Financial Markets

Open up any quality newspaper and you see that global financial markets matter a great deal. Nearly all employers are directly or indirectly affected by changing market prices. Nearly all employers are directly or indirectly affected by changing market prices. On the other hand, employees and households in general hold financial assets or indirectly affected by changing market prices. Open up any quality newspaper and you see that global financial markets matter a great deal. Nearly all employers are directly or indirectly affected by changing market prices. On the other hand, employees and households in general hold financial assets or indirectly affected by changing market prices. On the other hand, employees and households in general hold financial assets or indirectly affected by changing market prices.

EM 3: Fundamentals in Financial Engineering

Financial Engineering is an important component of quantitative finance and risk & asset management. This module introduces and applies essential financial engineering tools to applications from corporate finance and quantitative asset/risk management. For the corporate finance applications, this module teaches how managers optimize the financing structure and the dividend policy of firms. For the asset/risk management application, the module conveys essential quantitative and computational tools to build superior forecasting models for expected returns and risks of equity and fixed-income investments.

EM 4: Advanced Financial Engineering

This module provides a unifying approach to the pricing of derivative securities. Moreover, the most important concepts pertaining to term structure modeling are discussed and participants are introduced to the efficient use and implementation of pricing and risk management methods on derivative and fixed income securities markets.

The participants develop an understanding of the underlying evaluation theory, realize its limitations, and apply economic and mathematical approaches to analyze and understand financial products. Tools of risk management enable the participants to carry out major risk assessments and sensitivity analyses. They learn how to use computer-assisted methods for implementation of evaluation and risk management methods.

During the course on derivatives, they thoroughly cope with financial and derivative markets, study static and dynamic trading strategies and conceive option price theory as a central approach to assessing derivative instruments. During the course on fixed income, the participants get acquainted with the central concept of yield curve, apply option price theory to assess interest derivatives and acquire the ability of managing interest change risks.

EM 5: Risk Management

In this module, risk management is introduced by the following aspects: risk analysis, risk sensitiveness, risk assessment, and risk rating regarding the economic and financial risks of an organization.

The graduates will be familiar with approaches to the dynamic optimization of risk-return profiles that are, for example, of importance to asset management in insurance companies or investment funds. Additionally, they are acquainted with the possibilities of engineering contracts for transfer of selected risks and know that trading with such tools is an important risk management strategy.

During the courses on insurance, risk analysis and asset liability management, and credit risk and operational risk, the participants thoroughly cope with all these aspects of risk management and the limitations of the relevant methods. Hence, they are well prepared for career paths in e.g., banks, capital investment companies, insurance companies, consulting firms, and finance departments in large industrial enterprises in Germany and abroad.
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, analyzing 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 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 understanding of stochastic phenomena and, in particular, the overall banking sector or corporate finance departments successfully. The legal section is divided into lectures about the economics are discussed, e.g. stagnation and economic business strategy are presented.

MM 4: Stochastic & Games
This module enables participants to gain a better understanding of stochastic phenomena and, in particular, to use this knowledge in helping them to make decisions when in a state of uncertainty. Uncertainty can arise from either «nature» or from playing against conscious opponents («strategic uncertainty»).

MM 5: Law & Contracts
This module comprises both economics 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 economies 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 October consists of 10 intensive modules, each with a duration of 10 days. At the end, all programs conclude with a Master Thesis.
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.

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