Nowadays financial as well as other service markets are characterized by a strong interrelation with Information Service Management due to the original set-up of the financial markets. New financial products depend e.g. on the information technological feasibility.

The overall objective of the module is therefore to provide an introduction into market engineering with an emphasis on the design and the further development of information markets and services.

The module enables participants to understand and analyze business innovation and adaptation processes 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.

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 to save for retirement. It is therefore a natural question to understand how prices are formed on stock and bond markets and how to build optimal portfolios.

It is the goal of this module to shed light on both questions. This module introduces theoretical and empirical insights to help you understand global financial markets. The main focus is on building valuable intuition that will turn out to be very useful for advanced courses and for the professional career.

Participants will understand the main risk/return characteristics of equity and fixed-income markets from a conceptual and empirical point of view. There are scientific reasons for why in the long-run equity beats bond investments, and why it is even more advantageous to combine both asset classes into a single portfolio.

Philip Schultheiß
HECTOR School Intake 2005 & Graduate of the Master Program Financial Engineering
Introduction to 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.

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.

Advanced Risk & Asset Management

In this module, risk management is introduced by the following process 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.

Overview Engineering Modules (EM)

EM 1: Information & Service Management
Courses: Information & Market Engineering, Service Management & Innovation

EM 2: Global Financial Markets
Courses: Global Financial Markets

EM 3: Introduction to Financial Engineering
Courses: Corporate Financial Engineering, Tools for Financial Engineering

EM 4: Advanced Financial Engineering
Courses: Derivatives, Fixed Income

EM 5: Advanced Risk & Asset Management
Courses: Advanced Risk & Asset Management