MASTER OF
BUSINESS ADMINISTRATION AND ENGINEERING
Courses are taught in German unless it is specifically stated that the language of instruction is English.

Table of Contents

Access types .......................................................................................................................... 2
Business Administration ........................................................................................................ 6
Accounting ............................................................................................................................. 7
Economics .............................................................................................................................. 8
Private Commercial Law ....................................................................................................... 9
Cost Accounting .................................................................................................................. 10
Finance and Investment ....................................................................................................... 11
Economics and Economic Policy ......................................................................................... 12
Controlling ............................................................................................................................ 13
People Leadership ................................................................................................................ 14
Law of Corporate Organisation & Compliance .................................................................. 15
Technical Marketing .............................................................................................................. 16
Business Planning and Organization .................................................................................... 17
Innovation Management ....................................................................................................... 18
Supply Chain Management .................................................................................................. 19
Automation Technology ....................................................................................................... 20
New Technologies I ............................................................................................................. 21
New Technologies II ........................................................................................................... 22
Corporate Taxation ............................................................................................................... 23
Technical Product Management and International Sales ...................................................... 24
Information Engineering ...................................................................................................... 25
Digital Factory Planning ....................................................................................................... 26
European Construction Law & European Award of Public Works Contracts ..................... 27
Project Development & Public Private Partnership .............................................................. 28
Access types

- Engineering
- Engineering and Management
- Civil Engineering
Access type: Engineering

<table>
<thead>
<tr>
<th>Sem</th>
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## Master of Business Administration [MBA]

**Access type: Civil Engineering**

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Business Administration

Learning objectives / competencies:
By the end of the course students will:

- Be able to identify the economic aspects of specific topics covered in the current business press.
- Understand the relevant relationships between businesses and the environment when making constitutive decisions in corporate management.
- Understand the key business processes and operational functions of service provision and utilization.
- Recognize the role of cooperation throughout the company and cross-functional management.

Course content:

- Constitutive decisions (selection of legal form and location, forms of cooperation and concentration).
- Corporate objectives and key business figures (productivity, efficiency, profitability, liquidity).
- Business processes and the basic functions of operational performance and utilization.
- Management and cooperation of value creation processes in the macroeconomic circulation of goods and money.
- Identifying market and corporate developments.
Accounting

Learning objectives / competencies:

By the end of the course students will:

- Understand the basic principles and procedures of accounting.
- Be able to assess how a balance sheet changes as a result of entrepreneurial actions.
- Know which assets and liabilities need to be included in a balance sheet under German law and international law.
- Be able to calculate balance sheet totals according to German law and international law.
- Be able to prepare a profit and loss account.

Course content:

- Accounting principles
- Accounting under German law
- Accounting under international law
Economics

Learning objectives / competencies:

By the end of the course students will:

- Understand macroeconomic interrelationships.
- Be able to make the connection between economics and business studies in order to understand the economic consequences of corporate activities.
- Understand the operational consequences of macroeconomic developments and policy decisions.

Course content:

- Performance of the market: how do markets work and why are they efficient?
- Price formation in different types of markets: creation of optimal corporate strategies and restraints on competition: economic policy measures to guarantee competition.
- Growth and jobs: theoretical considerations, current trends and economic policies.
- International economics: theory of foreign trade, representation and analysis of external economic ties.
Private Commercial Law

Learning objectives / competencies:

By the end of the course students will:

- Understand the connections between business and law, and include them in their decisions and problem solving.
- Be familiar with the methods of legal casework and be able to refer to legal texts in the relevant jurisdictions.

Course content:

- Basics of business law with international links.
- References to procedural law and non-judicial arbitration models.
- Individuals, corporations, property and legal relations.
- Contract types, conclusion of contracts, termination of contracts and disputes over contracts.
- Credit and credit insurance, insolvency law.
- Consumer protection and liability for manufacturing and services.
- Principles of intellectual property.
Cost Accounting

Learning objectives / competencies:

By the end of the course students will:

- Be able to transfer expenses from accounting into costs.
- Be able to perform internal cost allocations in accordance with the type of internal costs and using the proper procedures.
- Be able to calculate the cost of one product in accordance with the type of production and using the correct calculation method.
- Understand how a specific decision can affect profit.
- Recognize the shortcomings of traditional cost accounting methods and be able to provide alternative solutions.

Course content:

- Cost classification
- Cost centre accounting
- Cost unit accounting
- Direct costing
- Activity-based costing
- Planned cost accounting
Finance and Investment

Learning objectives / competencies:

By the end of the course students will:

- Understand the basics of investing and finance.
- Be familiar with the instruments of financial controlling.
- Be familiar with the instruments of investment controlling.
- Be familiar with the instruments used in funding.
- Understand the impact that investment and financial management has on the survival of companies.
- Be able to identify the context of and background to financial decisions using practical examples.

Course content:

- Basics of finance and investment business
- Companies as a bundle of cash flows
- Examples of financial mathematical applications
- Analysis of financial reports and interim corporate figures
- Investment calculation methods
- Instruments used in funding
- Financial and risk policies
Economics and Economic Policy

Learning objectives / competencies:

By the end of the course students will:

- Have deepened their knowledge of basic macroeconomic relationships based on selected topics.
- Be able to analyse current business developments and their social and operational consequences.
- Be able to apply the economic approach to operational and macroeconomic problems.

Course content:

- Market failure: the market outcome is not always efficient. What can the government do about this?
- The labour market in times of globalization: theoretical analysis and empirical facts.
- Foundations of macroeconomics: the balance between money and merchandise markets.
- Monetary and fiscal policy: critical analysis of current events.
Controlling

Learning objectives / competencies:

By the end of the course students will:

- Understand the link between corporate governance, controlling, cost accounting and bookkeeping.
- Understand the role of the controller within the context of planning and controlling.
- Be familiar with the concepts behind and functions of strategic and operational controlling.
- Be familiar with and able to apply the tools used to solve controlling problems.

Course content:

- Process of strategic controlling: strategic analysis, strategic choice, strategic control.
- Instruments used in strategic controlling: traditional performance measurement systems, balanced scorecard, value-orientated corporate management, etc.
- Operational controlling process: budgeting, forecasting, operational control, variance analysis, etc.
- Implementation of operational controlling with standard software, such as Corporate Planner.
- Operational controlling instruments: target costing, lifecycle calculations, zero base budgeting, overheads analysis, etc.
People Leadership

Learning objectives / competencies:

The module prepares students for their first management position. By the end of the course students will:

- Be familiar with their own role and display the personal attributes required for management.
- Understand the tasks associated with the job and how to interact with the rest of the line of authority.
- Understand the role of management with regard to the development and evaluation of staff.
- Understand the dynamics of change processes and how they can successfully tackle these as a manager.

Course content:

- What is management? The role and responsibilities of a manager and management styles.
- Basics of motivation
- Managing teams
- Tasks of the personnel function, interactions with the rest of the line of authority.
- Recruitment and induction of new employees
- (Critical) staff meetings
- Delegation
- Development of staff
- From colleagues to line managers
- Processes of change and the role of a manager
Law of Corporate Organisation & Compliance

Learning objectives / competencies:

By the end of the course students will:

- Know the basics of employment law and employment court proceedings.
- Be familiar with the factors that shape employment law and can apply them, both preventatively and in cases of conflict.

Course content:

- Sources of law, history and function of employment law in the economic legal system with reference to European law.
- What is an employer-employee relationship? Definition of an employee.
- Reasons for employment contracts: application - appointment - employment contract.
- Content of employment contracts: implementation of the employment contract - rights and obligations.
- Problems arising in employer-employee relationships: illness - poor or non-performance - breach of duty.
- Ending employment contracts: termination - cancellation agreement – expiration.
- Main features of collective employment law: works councils and operating agreements - unions and employers’ associations - collective agreements and labour disputes.
Technical Marketing

Learning objectives / competencies:

By the end of the course students will:

- Understand the basics of marketing for capital goods and consumer durables.
- Be aware of the requirements of and procedures for the segmentation of markets and the positioning of products.
- Understand the context of the integrated product lifecycle.
- Recognize the impact that technology management and marketing have on a company’s success.
- Be able to identify the strategic context of and background to marketing decisions.
- Be able to use their acquired knowledge in case studies and project work.

Course content:

- Marketing basics
- Segmentation and positioning
- Approach to market research
- Integrated product life cycle
- Products as a technology mix
- First-mover/follower problem
Business Planning and Organization

Learning objectives / competencies:

By the end of the course students will:

- Be familiar with the procedures and methods of strategic and tactical operational planning and designing performance (products, services) in the different life stages of a company.
- Be familiar with the procedures and methods of strategic and tactical operational planning and designing the organization (organizational structure, sequence and process organization, project organization) in the different life stages of a company.
- Be able to select appropriate methods and procedures and use them in accordance with the task and industry.

Course content:

Strategic planning and designing business concepts; long-term objectives; resources (finances and expertise); product market concepts; SWOT analysis; creation of performance strategies; creation of organizational strategies with organizational structure, including the creation of positions and a hierarchy; capacity calculations; process planning and optimization; derived business plan and investment plan preparation; the problem of uncertainty in all areas of strategic planning and design.

Implementation of performance and organizational strategies with project management for projects lasting several years; strategic planning interface for annual (budget) planning; the problem of adjusting annual planning during the current year.

Management of priority conflicts and crisis situations in current operations (lean management, re-engineering, rationalization, innovation management).

Feedback through key performance indicators and balanced scorecards; the problem of designing key figure systems.
Innovation Management

Learning objectives / competencies:

By the end of the course students will:

- Understand the parameters of innovation and innovation management in technology-orientated companies.
- Have gained an insight into the problem of generating and managing innovation in companies.
- Be familiar with the application of innovation management methods.

Course content:

- Management of concurrent innovation implementation and routine tasks within a company.
- Selection of fields of innovation with practical tasks and concrete implementation methods, such as TRIZ.
- Methods using practical company tasks.
Supply Chain Management

Learning objectives / competencies:

By the end of the course students will:

- Understand the need to build partnerships between suppliers and customers.
- Be able to evaluate the design of different supply chains.
- Understand the relevance of process-oriented material, information and financial flow designs.
- Be able to implement SCM in a company.
- Understand SCM methods.
- Have gained experience from practical examples.

Course content:

- Basics of SCM
- Business valuation methods
- Models of cooperation with partner companies
- Process management (SCOR model, value stream mapping)
- Global footprint management
- Procurement and distribution logistics methods
- Control methods
- IT support for SCM
Automation Technology

Learning objectives / competencies:

By the end of the course students will:

- Be familiar with the tools of analysis for technical and non-technical systems for assessing and selecting appropriate automation methods (quality, stability, dynamics) and optimization methods.
- Be familiar with a range of (technical and non-technical) automation technologies and automation objectives using examples of basic applications.
- Understand the potential of and problems associated with modern process control engineering.

Course content:

- Systems engineering
- Methods and tools
- Structure-stable systems
- Development and optimization concepts
- Automation solutions
- Technical concepts
- Software tools (Fuzzy, Neuronetze)
- Interfaces and communication
- Control technology (operation and observing)
- Visualisation techniques
- Human-machine interface
- Telecontrol, telemaintenance
New Technologies I

Learning objectives / competencies:

By the end of the course students will:

- Have an overview of the potential and trends of the effective use of energy in small and medium enterprises (SMEs).
- Be able to provide a technical overview, with explanations, for a chosen subject area in applied computer science.
- Be able to evaluate practical applications of innovative information technology and technical management perspectives.
- Understand the selection and application of products or methods from the above mentioned topics.

Course content:

Current issues relating to energy efficiency in SMEs, e.g.

- Energy supply
- Electrical drive power
- Lighting
- Compressed air
- Building envelope
- Process heat
- Heating, ventilation, air conditioning

Current topic in information technology and computer science, e.g.

- Concepts and applications of cloud computing
- Future Internet: the Internet of Things
- Secure e-mail process, De-Mail
- Innovative terminals (e.g. touchpads)
- Service-oriented architectures
- Sustainability in IT
New Technologies II

Learning objectives / competencies:

By the end of the course students will:

- Have an overview of the current trends and developments in genetic engineering and nanotechnology, physical/biochemical principles and future applications of various nanotechnologies and genetic engineering processes and products.
- Understand the potential (and potential risks) of genetic engineering and nanotechnology products.

Course content:

Nanotechnology

Definition and scope of nanotechnology:

- Nanotechniques and nanotechnologies (processes & procedures)
- Nanoproducts (semiconductors, DNA analysis, and nanoparticles)
- Photonics
- From R&D to the production of nanoproducts
- Opportunities and risks of nanoproducts

Gene technology

- Definition and market data
- Basics: biomolecules and cells
- Gene technology methods for the production of transgenic organisms, plants and animals, gene therapy
- Use of genetic engineering in the analysis
- Opportunities and risks of genetic engineering methods
- Application examples
Learning objectives / competencies:

By the end of the course students will:

- Know the necessary basics of tax code brackets for all types of tax, including everything from general tax definitions to the basics of criminal tax law.
- Understand the necessary basics of the following specific types of tax: income tax, corporation tax, business tax, sales tax and international tax law.
- Be able to demonstrate the impact of taxation on business decisions, including everything from the choice of legal reform and location to tax planning and tax policies.

Course content:

- Tax codes
- Income tax
- Corporation tax
- Business tax
- VAT
- International tax law
Technical Product Management and International Sales

Learning objectives / competencies:

By the end of the course students will:

- Understand the organizational integration of product management and the main tasks and personal requirements of product management.
- Be aware of the different distribution channels and their advantages and disadvantages, possibilities and limitations.
- Be able to use their acquired knowledge in case studies and project work.

Course content:

- Basics of product management
- Sale of technical products
- Distribution
Information Engineering

Learning objectives / competencies:

By the end of the course students will:

- Understand and be able to classify the terms Information Engineering (IE) and Information Management (IM).
- Be familiar with the current strategic, administrative and operational requirements for IM.
- Be able to explain and evaluate strategic, administrative and operational approaches to solving current IM tasks.
- Be familiar with the methods and models of process management in business, particularly in the IT sector.
- Know about current business-related tasks, trends, methods, and approaches associated with information technologies.

Course content:

- Basic concepts and models
- Current requirements for Information Management (IM)
- Strategic IM and cross-cutting tasks (e.g. IT strategy development, IT governance, IT architecture)
- Tactical, administrative, operational IM (e.g. IT process organization, enterprise content management, information lifecycle management)
- IT process organization (e.g. CMMI, ITIL)
- New business concepts relating to the use of information technologies (e.g. interactive value creation, open innovation, mass customization)
Digital Factory Planning

Learning objectives / competencies:

By the end of the course students will:

- Be familiar with the areas of technology and business in which simulations are used.
- Know when a simulation can be carried out economically.
- Understand the general conditions are required to perform a simulation.
- Have deepened their knowledge using the example of production process simulation.
- Have learnt about the interfaces and data processing applications based on simulation results (e.g. digital factory planning).

Course content:

- Theoretical development of the simulation model
- Formation of the required database
- Practical examples of simulations
- Modelling and execution of simulation experiments
- Verification of the model results
- Digital factory planning
European Construction Law & European Award of Public Works Contracts

Learning objectives / competencies:

By the end of the course students will:

- Be familiar with the European construction law and public procurement law. In particular regulations of the FIDIC
- Be familiar with the VOB/B and the main VOB/C regulations
- Know how to handle performance changes and interferences
- Become acquainted with public procurement law related problems at advertised biddings above and below the EC- threshold value
- Get a read about the prime regulations in international building and architect contracts
- Demonstration of alternative dispute resolution

Course content:

A) European Construction Law
B) European Award of Public Work Contracts
C) Current particular problems at the construction law
   ▪ Lump sum contracts (consequences at altered/additional performance)
   ▪ Performance/ construction sequence problems and claim for reimbursement prerequisites at additional costs
   ▪ Specified problems with claims for defects
   ▪ Legal securities for contractors (§§ 648, 648a BGB, GSB)
   ▪ International rules on competences/ choice of court agreements
   ▪ The current state of implementation of EU legislation (EC directives) in German awarding law (GWB, VgV, VOB/A)
   ▪ Introduction in the FIDIC construction contract terms
   ▪ Options for alternative dispute resolutions
**Project Development & Public Private Partnership**

**Learning objectives / competencies:**

By the end of the course students will:

- Be familiar with the institutions, scope of duties and involved parties for project development
- Be able to perform calculation of profitability with legal considerations of client interests and ways of funding
- Know the basics of developed and undeveloped real estate property rating in line with WertVO (regulation on the determination of value) and relevant evaluation methods
- Be familiar with the principals of project handling as PPP model

**Course content:**

- Organisational structure of project development
- Valuation of real estates
- Funding and taxation
- Site development
- Calculation of profitability of real estates
- Private Public Partnership (PPP)
- Legal emphases with contractual forms of project development and PPP