Module description of elective subjects
for the bachelor programs:

Communications Engineering (B.Eng)
Software Engineering and Media Informatics (B.Eng)
Computer Engineering (B.Eng)
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**Important Notice:**

The catalogue of elective subjects is constantly in revision. Significant for the offered subjects in each semester are the board notices.

**Abbreviations**

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Elective Subjects

in

Winter Semester

Notice:
The following electives are usually offered in winter semester.
Algorithms

Analysis and Implementation of Algorithms, Complexity

Target group(s): 7. Semester KTB
7. Semester SWB
7. Semester TIB

Module number: IT 701-01

Workload: 2 Credits
Contact hours 60 Hours
Self study 30 Hours
Exam preparation 15 Hours

Language of instruction: German

Module owner: Prof. Dr. Koch

Date: 01. 09. 2012

Prerequisites:
Mathematics 1-3, MATLAB

Total Target:
The students understand the main algorithms of information technology, and are able
to evaluate the effectiveness of algorithms.

Module content:
• Data structures
• Complexity of algorithms
• Search- and sorting algorithms
• Data compression
• Convex Hull
• Voronoi diagram, Delaunay triangulation
• Sparse matrices
• FFT, polynomial multiplication
• Monte Carlo method, TSP

Reference material:
• Robert Sedgewick: Algorithmen, Pearson Studium
• Donald Knuth: The Art of Computer Programming, Addison Wesely

Offered:
Winter semester

Submodules and assessment:

Type of instruction: Lectures with follow-up work and preparation for examination

Type of assessment: Oral examination, 20 minutes

Semester periods per week: 2 SWS

Estimated student workload: 60 hours

Aims, learning outcomes:
• Overview over the most important algorithms
• Characteristics and performance of algorithms
• Implementation and testing in C, C++ or Matlab
Audio Signal Processing

Speech encoding, audio encoding, spectral analysis, echo cancellation

Target group(s): 7. Semester KTB 7. Semester SWB 7. Semester TIB

Module number IT 701-02

Workload: 2 Credits 60 Hours
therefrom Contact hours 30 Hours
Self study 15 Hours
Exam preparation 15 Hours

Language of
instruction: German
Module owner: Prof. Dr.-Ing. Karlheinz Höfer

Date: 01. 09. 2012

Prerequisites:
Knowledge of digital signal processing

Total Target:
The students understand the principles of digital audio and voice signal processing
and their encoding.

Module content:
- Spectral analysis of audio and speech
- Recursive and nonrecursive audio signal processing
- Usage of signalprocessors in audioprocessing
- Space impulse response and space simulation
- Emergence and cancellation of echoes
- Psychoacoustic basics of sound perception
- Lossless audio encoding
- Lossy audio encoding
- Standards of audio and speech encoding

Reference material:
- Udo Zölzer: Digitale Audiosignalverarbeitung, Teubner Verlag

Offered:
Winter semester

Submodules and assessment:

Type of instruction: Lectures with follow-up work and preparation for examination
Type of assessment: Oral examination, 20 minutes

Semester periods per week: 2 SWS
Estimated student workload: 60 hours

Aims, learning outcomes:
- Knowledge of analysis, distribution and coding of audio signals
- Overview over current audio boards
E-Commerce


Target group(s): 7. Semester KTB
7. Semester SWB
7. Semester TIB

Workload: 2 Credits
60 Hours
therefrom

Contact hours
30 Hours

Self study
15 Hours

Exam preparation
15 Hours

Language of instruction: English

Module number IT 701-03

Module owner: Prof. Dr.-Ing. Warendorf

Date: 01. 09. 2012

Prerequisites: None

Total Target:
Introduce Students to the fundamental concepts of E-Commerce and the Internet.

Module content:
- E-Commerce – the revolution is just beginning
- E-Commerce business models and concepts
- The Internet and World Wide Web: E-Commerce infrastructure
- Building an E-Commerce Web Site
- Security and encryption
- Payment
- E-Commerce marketing concepts
- E-Commerce marketing communications
- B2B E-Commerce: Supply chain management and collaborative commerce

Reference material:
- K. Laudon, C. Traver: E-Commerce, Prentice Hall

Offered:
Winter semester

Submodules and assessment:

Type of instruction: Lectures with follow-up work and preparation for examination

Type of assessment: Oral examination, 20 minutes

Semester periods per week: 2 SWS

Estimated student workload: 60 hours

Aims, learning outcomes:
The main focus will be on studying the different aspects of eCommerce and to understand the underlying processes and technical background as well as the marketing aspect. Students will also be doing practical training on Webdesign, interactive Webpages (JSP), Usability and Project Work.
Module description of elective subjects
Faculty of Information Technology

Introduction to CAD

3D CAD, construction, curves, planes

Target group(s): 7. Semester SWB 7. Semester TIB
Module number: IT 701-04

Workload: 2 Credits 60 Hours
therefrom Contact hours 30 Hours
Self study 15 Hours
Exam preparation 15 Hours

Language of instruction: German
Module owner: Prof. Dr. Koch, Michael Brill

Date: 01. 09. 2012

Prerequisites: Mathematics 1-3 and Computer Science 1-3

Total Target:
The students shall develop an understanding of the construction with a 3D CAD-system and know basic methods and procedures.

Module content:
- History of CAD
- Types of CAD systems
- CAD data formats
- CAD process chain
- Short introduction to CATIA V5 by means of simple examples
- Macro programming with CATIA and Visual Basic
- Mathematical foundations of curves and planes
- Mathematical representation of free formed curves and free formed surfaces
- Trimmed surfaces, surface models, volume models
- Representation of planes and curves using polygons and networks

Reference material:
- Michael Brill: Parametrische Konstruktion mit CATIA V5. Methoden und Strategien für den Fahrzeugbau, Hanser Verlag
- Alyn Rockwood and Peter Chambers: Interactive Curves and Surfaces, Morgan Kaufmann Publishers, Inc.

Offered: Winter semester

Submodules and assessment:

Type of instruction: Lectures with follow-up work and preparation for examination
Type of assessment: Oral examination, 20 minutes
Semester periods per week: 2 SWS
Estimated student workload: 60 hours

Aims, learning outcomes:
- Overview over the most important software systems for CAx-EDM
- Knowledge of the most important CAD terms and the ability to communicate with construction engineers
- Knowledge of the most important CAD graphic formats
- Individual realization of a simple CAD construction example
- Knowledge of the basic procedures for macro programming
- Knowledge of mathematical basics of curves and planes
- Knowledge of the most important CAD representations of curves, planes and objects
Enterprise 2.0 – Using Social Software in Enterprise Settings

**Potentials, Architectures and Operations of Social Software Applications within the Enterprise Domain**

**Target group(s):**
- 7. Semester SWB
- 7. Semester TIB
- 7. Semester KTB

**Workload:**
- 2 Credits
- 60 Hours
- 30 Hours Contact hours
- 15 Hours Self study
- 15 Hours Exam preparation

**Language of instruction:**
- German, English on demand

**Prerequisites:**
Basic knowledge regarding the state of art of Social Software Applications (Wikipedia, Facebook etc.)

**Total Target:**
Students will acquire knowledge on how to design and implement Social Software Applications within the Enterprise Domain.

**Module content:**
- Basics of Social Software and Enterprise 2.0
  - History, Terms, Definitions
  - Application classes
  - Application domains within the enterprise
  - Wikimanagement
  - Social Software in Social Reality Construction
  - Motivational factors
- Architectural concepts of Enterprise 2.0 Solutions
  - Multi-tier Architectures
  - Centralized and Replicated Architectures
  - Web-based Architectures
  - Design Patterns (Shared Objects, MVC, Proxy Objects, Object Factory etc.)
  - Event Handling
  - Experimental Approaches
- Service Operation
  - Basic Requirements of the Enterprise Domain
  - Development, Staging and Production Environments
  - Scalability
  - Release Management and Staging
  - Line-Switch and Synchronization Processes

**Reference material:**

**Offered:**
Winter semester

**Submodules and assessment:**
- Type of instruction: Lectures with follow-up work and preparation for examination
- Type of assessment: Oral examination, 20 minutes
- Estimated student workload: 60 hours

**Aims, learning outcomes:**
This lecture contains theoretical and practical parts. In the theoretical parts, we focus on conceptual knowledge regarding Social Software and Enterprise 2.0. In the practical parts, we are going to develop small Social Software Applications using Open Source Standard Software. In addition, we will have two practitioners giving lectures on their practical experiences regarding Enterprise Social Software.
Motor Vehicle Systems

Functionality, architecture and security of motor vehicle systems

Target group(s): 7. Semester KTB
7. Semester SWB
7. Semester TIB

Workload: 2 Credits
therefrom
Contact hours
Self study
Exam preparation

Language of instruction: German

Module number IT 701-05

Contact hours 30 Hours
Self study 15 Hours
Exam preparation 15 Hours

Prerequisites:
The students understand the composition and the functionality of motor vehicle systems.

Total Target:
Understanding of the composition and functionality of motor vehicle systems

Module content:
- Knowledge about hardware concepts for the application in automotive engineering
- Knowledge about control units
- Communication of control units
- EMC in motor vehicles
- Hardware and software requirements

Reference material:

Offered:
Winter semester

Submodules and assessment:
Type of instruction: Lectures with follow-up work and preparation for examination
Type of assessment: Oral examination, 20 minutes

Semester periods per week: 2 SWS
Estimated student workload: 60 hours

Aims, learning outcomes:
Hardware architecture and functionality of control units, boundary conditions and requirements of Motor Vehicle Systems
Methods of Artificial Intelligence

Introduction to programming methods of artificial intelligence with an introduction into the programming language PROLOG

Target group(s): 7. Semester SWB 7. Semester TIB

Workload:
- Contact hours: 60 Hours
- Self study: 30 Hours
- Exam preparation: 15 Hours

Language of instruction: German

Module owner: Prof. Dr. Heinrich Weber

Prerequisites:
A high level programming language, simple search algorithms and elementary logic.

Total Target:
Besides the well known imperative programming languages the students shall also get to know the handling of an AI-language and its underlying paradigms and learn to use them in simple applications.

Module content:
- Derivative systems
- Backtracking and non-backtracking retrieval strategies
- Navigation in state spaces
- Depth-first search
- Construction of algorithms with the aid of derivative systems
- Predicate logic
- Normal forms
- Clause sets
- Horn-clauses
- Term reductions systems
- Unification algorithms
- Resolution calculus
- Introduction to PROLOG
- Classic examples and exercises for PROLOG

Reference material:
- Uwe Schöning: Logik für Informatiker, Spektrum Akademischer Verlag

Offered: Winter semester

Submodules and assessment:

Type of instruction: Lectures with follow-up work and preparation for examination

Type of assessment: Oral examination, 20 minutes

Semester periods per week: 2 SWS

Estimated student workload: 60 hours

Aims, learning outcomes:
Viewing problems and solutions as marked states in a solution space, the step-by-step transformation of states, using AI methods and the programming language PROLOG for suitable problems.
Quality Engineering

Quality management, quality tools, ISO 9001

Target group(s): 7. Semester KTB 7. Semester SWB 7. Semester TIB

Module number IT 701-07

Workload: 2 Credits 60 Hours
therefrom Contact hours 30 Hours
Self study 15 Hours
Exam preparation 15 Hours

Language of instruction: German
Module owner: Herbert Grübel
Date: 01. 09. 2012

Prerequisites:
Experiences from the practical term.

Total Target:
The students get to know methods for prevention and solving of problems to ensure quality in companies.

Module content:
• Insight into the world of quality management
• Elementary quality tools
• Management tools
• Presentation of quality functions
• Analysis of failure possibility and failure impact
• Statistical test planning
• Statistical process control

Reference material:
• Philipp Theden, Hubertus Colsman: Qualitätstechniken, Hanser Verlag

Offered:
Winter semester

Submodules and assessment:

Type of instruction: Lectures with follow-up work and preparation for examination
Type of assessment: Oral examination, 20 minutes

Semester periods per week: 2 SWS
Estimated student workload: 60 hours
Aims, learning outcomes: Knowledge of quality enhancement methods and tools
### Safety Related Embedded Systems

**Terms, basics and application specific characteristics of safety related embedded systems**

**Target group(s):**
- 7. Semester KTB
- 7. Semester SWB
- 7. Semester TIB

**Module number:** IT 701-08

**Workload:** 2 Credits 60 Hours
- Contact hours 30 Hours
- Self study 15 Hours
- Exam preparation 15 Hours

**Language of instruction:** English

**Module owner:** Prof. Reinhard Keller

**Date:** 01. 09. 2012

**Prerequisites:**
- Knowledge of courses from the basic study period
- Knowledge of courses
  - Computer Architecture 3
  - Real-Time Systems
  - Computer Science 3
  - System Technics 1

**Total Target:**
- Introduction to the technology of safety related systems
- Basic knowledge of safety related functions of embedded systems

**Module content:**
- Terms and Definitions in safety and related standards
- Risk Analysis
- Life Cycle Management of safety related systems
- Measures taken to ensure the required safety level
  - (Hardware, Software, Application Directives)
- Implementation and test of safety related products
- Related branch specific approaches
  - (Aviation, Railway, Automation, Automotive)
- Practical training: Project planning and approval of a safety related Application

**Reference material:**
- EN ISO 13849: Safety of machinery - Safety-related parts of control systems

**Offered:** Winter semester
System Architectures with .NET

Programming with .NET, Enterprise Services, Microsoft, certificate, COM+ architectures

Target group(s): 7. Semester SWB
7. Semester TIB

Module number: IT 701-09

Workload: 2 Credits
therefrom:
- Contact hours: 60 Hours
- Self study: 30 Hours
- Exam preparation: 15 Hours

Language of instruction: German

Module owner: Kevin Erath

Date: 01. 09. 2012

Prerequisites:
Experience with an object-oriented programming language, experience with databases and transactions

Total Target:
The students learn the techniques that are required for the conception and development of distributed, component-based applications in combination with .NET enterprise servers.

Module content:
- Introduction to .NET Enterprise Services
- .NET Enterprise Services architecture and programming model
- Application of ADO.NET for data access
- Transaction services
- Securing Enterprise applications
- State management
- Compensating resource managers (CRM)
- Loosely coupled events (LCE)
- Message queuing and queued components
- Error recovery for .NET Enterprise Services applications
- Distribution and administration of .NET Enterprise Services applications
- COM+ 1.5 extensions

Reference material:
- Christian Nagel: Enterprise Services with the .NET Framework, Developing Distributed Business Solutions with .NET Enterprise Services, Addison Wesley
- Clemens Vasters: .NET Enterprise Services, Hanser Verlag

Offered:
Winter semester

Submodules and assessment:

Type of instruction: Lectures with follow-up work and preparation for examination
Type of assessment: Oral examination, 20 minutes

Semester periods per week: 2 SWS
Estimated student workload: 60 hours

Aims, learning outcomes:
The students shall be enabled to develop Client/Server applications and extensive business solutions or to give advice during the development process.

Notice:
The lecture is held in cooperation with Microsoft in the course of the Microsoft IT Academy Program. It is led by a certified Trainer who meets the strict technical and didactic requirements of the Microsoft certification program. The students receive a Microsoft issued certificate to confirm their successful participation.
Contract and Internet Law

Contract law, computer law, internet law, data protection, trademark right

Target group(s): 7. Semester KTB 7. Semester SWB 7. Semester TIB

Workload: 2 Credits 60 Hours
therefrom Contact hours 30 Hours
Self study 15 Hours
Exam preparation 15 Hours

Language of instruction: German
Module owner: RA Markus Schließ
Date: 01. 09. 2012

Prerequisites:
None

Total Target:
Overview over the legal concept in information technology.

Module content:
- Introduction to the course topic
- Law basics
- Business start-up in the IT sector
- Computer law – types of contracts
- Computer law – conflict situations
- Computer law – software as intellectual property
- Computer law – data protection law and related laws
- Internet law – Basics
- Internet law – E-Commerce

Reference material:
- Lecture notes

Offered:
Winter semester
Elective Subjects
in
Summer Semester

Notice:
The following electives are usually offered in summer semester.
Television Technology

Color, digital television, encoding of video sources

Target group(s): 7. Semester KTB 7. Semester SWB 7. Semester TIB

Module number IT 701-22

Workload: 2 Credits 60 Hours
therefrom Contact hours 30 Hours
Self study 15 Hours
Exam preparation 15 Hours

Language of instruction: German

Module owner: Peter Schulz

Date: 01. 09. 2012

Prerequisites:
Basic knowledge in signals and systems.

Total Target:
Knowledge of the basics of television transmission.

Module content:
- Light and colour
- Human colour perception
- Colour models
- Image transmission, video signal
- Colour scanning
- TV-program distribution
- TV-transmission
- TV-satellite transmission
- Analogue television
- Digital television
- Compression of digital video data
- DVB-T, DVB-S, DVB-C

Reference material:
- G. Mahler: Die Grundlagen der Fernsehtechnik, Springer Verlag

Offered:
Summer semester

Submodules and assessment:

Type of instruction: Lectures with follow-up work and preparation for examination
Type of assessment: Oral examination, 20 minutes

Semester periods per week: 2 SWS
Estimated student workload: 60 hours
Aims, learning outcomes: Understanding of digital moving image transmission and distribution.
IT-Security

Attacks, threats, networks, systems, security measures

Target group(s): 7. Semester KTB 7. Semester SWB 7. Semester TIB

Module number IT 701-23

Workload: 2 Credits 60 Hours
- Contact hours 30 Hours
- Self study 15 Hours
- Exam preparation 15 Hours

Language of instruction: German / English

Module owner: Prof. Dr. Dominik Schoop

Date: 01. 09. 2012

Prerequisites:
- Basics in communication technology
- Programming language C

Total Target:
Encouragement of safety awareness, ability of risk evaluation and the selection of appropriate security measures in information technology.

Module content:
- Fundamental terms of IT-Security
- Basic attacks in computer networks
- Security weaknesses in network protocols (ARP, IP, UDP, TCP, ICMP)
- Attacks against systems (e.g. buffer overflows, viruses, worms)
- Access control in networks with firewalls
- Access control in systems
- Cryptographic Security services (symmetric, asymmetric, hybrid)
- Password authentication systems
- Challenge-Response-authentications systems
- Secure protocols (e.g. SSL, SSH)

Reference material:
- M. Bishop: Introduction to Computer Security, Addison-Wesley
- C. Eckert, IT-Sicherheit, Oldenbourg-Verlag
- N. Pohlmann: Firewall-Systeme, MITP-Verlag
- G. W. Seile: Kryptographie – Verfahren, Ziele, Einsatzmöglichkeiten, O’Reilly
- W. Stallings: Sicherheit im Internet, Addison-Wesley
- E. D. Zwick, S. Cooper, B. Chapman: Building Internet Firewalls, O’Reilly

Offered: Summer semester

Submodules and assessment:

Type of instruction: Lectures with follow-up work and preparation for examination
Type of assessment: Oral examination, 20 minutes

Semester periods per week: 2 SWS
Estimated student workload: 60 hours
Aims, learning outcomes:
The students shall be able to recognize security weaknesses in information technology, to estimate the existent risks and apply appropriate counter measures.
Cryptology

Symmetric and asymmetric encryption, cryptographic protocols

Target group(s): 7. Semester KTB 7. Semester SWB 7. Semester TIB

Module number IT 701-24

Workload: 2 Credits 60 Hours
therefrom 30 Hours
Self study 15 Hours
Exam preparation 15 Hours

Language of instruction: German

Module owner: Prof. Dr.-Ing. Reinhard Schmidt

Date: 01. 09. 2012

Prerequisites:
Knowledge in linear algebra.

Total Target:
Understanding for the necessity to use cryptographic techniques.
Evaluation of the security of cryptographic techniques and protocols.

Module content:
- Introduction to cryptography
  Terminology, Examples from history, substitution
  Transposition and rotor machines, steganography
- Cryptanalysis
  Possible attacks against chiffres, Kasiski and Friedman tests
- Security of cryptosystems
  Perfectly secure cryptosystems, the one-time-pad method of Vernam,
  Estimation of the Security of cryptosystems
- Symmetric crypto algorithms
  Feistel network, data encryption standard (DES), advanced encryption
  standard (AES), international data encryption algorithm (IDEA)
- Asymmetric crypto algorithms
  Introduction to number theory, RSA-method, ElGamal-method, practical
  application of asymmetric methods
- Cryptographic protocols
  Key exchange according to Diffie-Hellman, key exchange according to
  Hughes, no-key algorithm of Shamir, zero-knowledge-protocol of Feige-Fiat-
  Shamir, methods for message integrity, procedure for a digital signature,
  securing of anonymity, secure E-Mails
- Encryption in telecommunication
  Methods for encryption in mobile communication
- Digital money
  Security aspects, concepts for electronic payments
- Elliptic curves
  Mathematic foundations,
  Cryptographic procedures based on elliptic curves
- Prospect: biometric markers, quantum cryptography

Reference material:

Offered: Summer semester

Submodules and assessment:

Type of instruction: Lectures with follow-up work and preparation for
examination

Type of assessment: Oral examination, 20 minutes

Semester periods per week: 2 SWS

Estimated student workload: 60 hours

Aims, learning outcomes:
- B. Schneier: Angewandte Kryptographie, Pearson Studium
- D. Wätjen: Kryptographie, Spektrum Akademischer Verlag
Numerical Methods

**Iteration, Newton-Procedure, interpolation, approximation, extrapolation, Romberg-Procedure, Runge-Kutta, rounding error, stability**

**Target group(s):** 7. Semester KTB  
7. Semester SWB  
7. Semester TIB

**Module number IT 701-25**

**Workload:** 2 Credits  
60 Hours  
Contact hours 30 Hours  
Self study 15 Hours  
Exam preparation 15 Hours

**Language of instruction:** German

**Module owner:** Prof. Dr. Jürgen Koch

**Date:** 01. 09. 2012

**Prerequisites:** Basics of mathematics, MATLAB

**Total Target:**

The students get to know the most important techniques and terms of numerical mathematics.

**Module content:**

- Numerical Solution of linear systems of equations
  - Gauss algorithm
  - Rounding error problematic
  - Jacobi- and Gauss-Seidel-Iteration
- Numerical solution of non linear equations and systems of equations
  - Interval bisecting method
  - Fix point interaction
  - Newton method
- Interpolation and approximation
  - Polynomial interpolation
  - Newton scheme
  - Hermite interpolation
  - Method of smallest error squares

**Reference material:**

- Richard Mohr: Numerische Methoden in der Technik, Vieweg

**Offered:** Summer semester

**Submodules and assessment:**

**Type of instruction:** Lectures with follow-up work and preparation for examination  
**Type of assessment:** Oral examination, 20 minutes

**Semester periods per week:** 2 SWS  
**Estimated student workload:** 60 hours

**Aims, learning outcomes:**

- The students get to know the most important methods in numerical mathematics.
- The students are familiar with the most important features and terms of numerical methods.
- The students are able to apply numerical methods on simple examples
- The students are able to apply numerical methods for the solution of problems using MATLAB or C++-programs
- The students know the limits of the application of numerical methods (rounding errors, stability, computing time)
Parallel Computing

Programming of multiprocessor systems, cluster computing, grid computing

Target group(s): 7. Semester KTB  7. Semester SWB  7. Semester TIB

Module number IT 701-26

Workload:
- 2 Credits
- 60 Hours
- 30 Hours Contact hours
- 15 Hours Self study
- 15 Hours Exam preparation

Language of instruction:
- German / English

Module owner:
- Prof. Dr. Peter Väterlein

Date:
- 01. 09. 2012

Prerequisites:
- Principles of scalar computer architectures (von Neumann-/ Harvard architectures)
- Programming language C
- Operating system UNIX from the view of the user and the application programmer

Total Target:
- Knowledge and ability to evaluate different parallel computer architectures.
- Ability to design and implement applications for parallel computers

Module content:
- Overview over the common parallel server architectures
- Principles of designing parallel software
- Performance Evaluation of parallel Software
- Memory coupled and message coupled systems
- Load balancing and waiting line systems
- Basics of grid computing
- Practical exercises:
  - Programming of message coupled computer systems
  - Programming of multicore-processor architectures

Reference material:
- I. Foster: Designing and Building Parallel Programs, Addison Wesley, 1994

Offered:
- Summer semester
Technical Sales

Market, product, customer, fee, communication, distribution

Target group(s): 7. Semester KTB
7. Semester SWB

Module number IT 701-27

Workload: 2 Credits 60 Hours
therefrom
Contact hours 30 Hours
Self study 15 Hours
Exam preparation 15 Hours

Language of instruction: German / English

Module owner: Prof. Dr.-Ing. Harald Melcher

Date: 01. 09. 2012

Prerequisites: None

Total Target:

The course introduces students into the world of product marketing and technical sales. The students get to know the processes of marketing and sales before, during and after product development.

Module content: Market, product, customer, fee, communication, distribution

Reference material:
- H. Kohlert: Marketing für Ingenieure, Oldenbourg Wissenschaftsverlag
- D. Begg: Economics, McGraw Hill
- P. Winkelmann: Marketing und Vertrieb, Oldenbourg Wissenschaftsverlag
- Kleinaltenkamp: Technischer Vertrieb, Springer Verlag
- F. Schulz von Thun: Miteinander reden: Störungen und Klärungen, rororo Sachbuch
- J. P. Womack: The machine that changed the world, Harper Perennial

Offered: Summer semester

Submodules and assessment:

Type of instruction: Lectures with follow-up work and preparation for examination

Type of assessment: Oral examination, 20 minutes

Semester periods per week: 2 SWS

Estimated student workload: 60 hours

Aims, learning outcomes:
- Introduction into the world of product marketing and technical sales.
- The students get to know the marketing and sales processes before, during and after the development process.
Web-Technology

Development and Programming of Web Applications, JavaServer Faces, Ajax, Web 2.0

Target group(s): 7. Semester KTB
7. Semester SWB
7. Semester TIB

Module number IT 701-28

Workload: 2 Credits 60 Hours
therefrom Contact hours 30 Hours
Self study 15 Hours
Exam preparation 15 Hours

Language of instruction: German / English

Module owner: Prof. Astrid Beck, Andy Bosch

Date: 01. 09. 2012

Prerequisites: Proficiency in object oriented programming.

Total Target:
Get to know the methodical development and the programming of Web applications on the basis of the official standard JavaServer Faces from Sun. Get an Overview of the technology of JavaServer Faces and it’s framework.

Module content:

Web Development with JavaServer Faces
- Basics of web development
- Introduction to JavaServer Faces
- Installation of JSF
- A first easy example
- Navigation concept
- Conversion and validation of data
- Eventing
- Model-View-Controller Design Pattern
- Integration of RichFaces in a JSF Application
- Ajax-Basics
- Use of different performant UI components

Web Applications
- Conception, planning, controlling and strategic development of social media
- Blogs, microblogs, wikis, news aggregation sites, social tagging systems
- Instant messaging, discussion groups, chats, social networks, photo sites
- Web and user interaction
- Usability
- Attention and Motivation, Conversion rate
- Evaluation
- Communities, shops, fansites
- Basics in Search Engine Marketing

Reference material:
- M. Marinscheck, M. Kurz, JavaServer Faces 2.0: Grundlagen und erweiterte Konzepte dpunkt-Verlag
- Astrid Beck / Michael Mörike / Heinz Sauerburger (Hrsg.) Web 2.0 HMD - Praxis der Wirtschaftsinformatik Juni 2007

Offered: Summer semester

Submodules and assessment:

Type of instruction: Lectures with follow-up work and preparation for examination
Type of assessment: Oral examination, 20 minutes

Semester periods per week: 2 SWS
Estimated student workload: 60 hours

Aims, learning outcomes:
The lecture aims to introduce web development with the framework JavaServer Faces (JSF). The basics of web development are covered and put into practice by implementing an own JSF application. In doing so the most important concepts of JSF are covered, e.g. bean management, navigation, data validation or eventing.

As an look-out UI component libraries are introduced as well as Ajax as an Web 2.0 technology.

The students shall get to know and analyse current interactive web applications. The lecture is a mix of theoretical and practical modules. Goal driven, proactive, independent working, team assignments, presentations, practical exercises.