Compendium of Course Modules

Accreditation

of the Bachelor Degree Programme

Textile and Clothing Management

Faculty Textile and Clothing Technology
Compiled on 27.11.2017
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### Module
**TCM-10: Scientific Working and Study Tools**

*Studieneingangsphase*

<table>
<thead>
<tr>
<th>Language</th>
<th>English</th>
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<tr>
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<td>Workload</td>
<td>HpW 2 CP 2</td>
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### Lectures

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<tr>
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### Precondition:

#### Examinations

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<td>Scientific Working and Study Tools</td>
<td>T</td>
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### Remarks
**General Aims of Module**

The Study Startphase will enable students in a systematic order, to deal with the transition between school and academic studies organizationally as well as in terms of content. Thus, in particular the process of self-assessment is strengthened by the students. In this way specific deficits should be identified, competencies should be strengthened and further targeted learning opportunities provided.

The students are able to evaluate their competence with regard to the scientific use of digital media. They can select literature and obtain accurately. Students can plan their study time effectively and optimally prepare for lectures and seminars. The first use of learning techniques can be reached.

Scientific texts in their formal system can be generated by the students and presented in the form of smaller Word reports and integrated data formats.

In addition, students gain a thorough orientation in bachelor affairs and relevant organizational questions, to log on, such as, for example, examinations.

**Scientific Working and Study Tools**

**Content**

Various lectures and courses offer students knowledge and skills required especially already in the initial phase of a study course. This includes especially hints to organize the study course, prepare for examination and improve writing skills and scientific working.

Part of the course is done in groups of app. 20 students.

**Literature**
# TCM-20: Textile Materials

Textile Werkstoffe

<table>
<thead>
<tr>
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## Lectures

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## Examinations

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## Remarks

Examinations: 27.11.2017

Precondition:

Teacher: Prof. Dr. Kyosev, Yordan

Teacher: Prof. Dr. Kyosev, Yordan
General Aims of Module

The students know the main properties of the textile fibers as fiber length, fineness, strength, moisture absorption, UV stability and other specific properties. They are able to select the suitable fiber for certain application area for clothing and general technical applications. For the situations, where one fiber is not sufficient, the students can select appropriate combinations for fiber blends.

The students understand the production processes (wet, dry and melt spinning, for the natural fibers - the steps from harvesting to sliver production) for the textile fibers and are able to define the places and parameters, where the properties of the fibers can be influenced.

Practically the students are capable to perform microscopical analysis of single fibers and fiber blends and based on burning test, longitudinal view and cross section and solution schema of Dr. Strattmann they are able to identify the fiber types which are analyzed.
Textile Materials

Production, chemical and physical structure, common properties and application areas of natural and chemical fibers and their blends:
- Cotton, flax, wool, silk and other natural fibers
- Regenerated cellulose fibers - viskose, cupro, acetate and triacetate, lyocell, modal
- Polyester, polyamid, polypropylen, polyacrylnitril, aramid, natural and synthetic rubber, elastane, carbon, glass, basalt

Aspects for the separated topics:
- Relation between properties, quality and production process / harvesting conditions, moisture absorption
- Polymerisation, polycondensation, polyaddition, degree of polymerisation, crystalline and amorphous areas
- Hydrogen bonds, covalent and ionic bonds
- Mercerizing of cotton, carbonisation of wool, degumming of silk, vulcanisation of natural rubber, sulfid bonds
- Shrinkage and heat setting, texturizing, high volume yarns
- Wet and dry spinning, melt spinning
- Social, environmental and animal protection aspects as water consumption, organic cotton, genetic modification, pesticides, human rights and children work, mulesing for wool
- Textile labeling (European regulations)

Literature

Kyosev, Y., Textile Materials - Skript

Learning contents on the online platform Moodle

E. Wagner, Die Textilen Rohstoffe, Dr. Spohr-Verlag/Deutscher Fachverlag, 6. Auflage, 1981
A. Schenek, Naturfaser-Lexikon, Deutscher Fachverlag 2000
A. Nakamura, Fiber Science and Technology, Science Publisher 2000
W. Bobeth: Textile Faserstoffe, Springer-Verlag, 1993,
E. H. Schiecke, Wolle als textiler Rohstoff, Schiele & Schön, 1979
H. Doehner, H. Reumuth, Wollkunde, Paul Parey, Berlin 1964
W.S. Simpson, G.H. Crawshaw, Wool: Science and Technology
Ch. Brebeck, Kommentar zum Textilkennzeichnungsgesetz, Deutscher Fachverlag, 1986
Fasertafeln, aus Journal Chemical Fibers
B.v. Falkai, Synthesefasern, Verlag Chemie, 1981
F. Fourné, Synthetische Fasern, Hanser Verlag 1995
Z.A. Rogowin, Chemiefasern, Georg Thieme Verlag 1982
J. Svedova, Industrial Textiles, Elsevier Verlag 1990
H. Batzer, Polymere Werkstoffe Bd I-II, Thieme Verlag 1984
G. Schnelgesberg, Das Faserhandbuch, Deutscher Fachverlag 1999
H.L. Needles, Textile Fibers, Dyes, Finishes and Processes, Noyes Publication 1986
M. Stratmann, Erkennen und Identifizieren der Faserstoffe Spohr-Verlag 1973
**Practical Training Textile Materials**

**Content**

During the Practical Training Textile Materials the students investigate common used fibers with microscopes and learn to identify the fibers and their blends. The students prepare cross-sectional and longitudinal views of the fibers and analyse them using solutions according to the scheme of Stratmann.

Investigated are:
- cotton, raw and mercerized
- linen
- silk, normal and degummed
- wool
- viscose (Rayon)
- Cupro
- acetate und triacetate
- Lyocel
- Modal
- polyester
- polyamide
- polyacrylonitrile

A sample of polypropylene, aramid, natural and synthetic rubber, elastane, carbon, glass, basalt. Analysis of one unknown fiber and a blend of two unknown fibers.

**Literature**

Learning contents on the online platform Moodle

M. Stratmann, Erkennen und Identifizieren der Faserstoffe Spohr-Verlag 1973
Module  
TCM-30: Basics of Textiles  
*Textiltechnische Grundlagen*

Language  
English

Responsible  
Prof. Dr. Alexander Büsgen

Workload  
HpW 4  CP 5

60h presence

43h preparation and follow-up work (exercises, literature, tutorials)

22h preparation for examination

### Lectures

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<td>Fabric Technology</td>
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Precondition: none

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<td>TCM-30</td>
<td>Basics of Textiles</td>
<td>Pr</td>
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### Remarks
General Aims of Module

Basics of Textiles serves right at the beginning of textile studies as an introduction to basic textile technologies. Yarn and fabric technologies impart basic knowledges about textile raw materials, production methods and machines and physical properties thereof. Students know and can explain all steps and most important variations of the textile chain from making a yarn until the creation of fabrics.

Students are able to call necessary working steps of producing and processing of textiles. They are able to list the different manufacturing and processing methods and they can select a suitable process for a given task and defined requirements of textiles. Furthermore, they are able to motivate, how properties and processing of textiles are changing by different raw materials, production methods and combinations. Students can calculate count, draw, productivity performance and twist.

Students can analyze fabrics (which basic elements having which orientation are connected in which way). Based on the analysis and the recognized structure, students are able to deduce important physical properties of fabrics. They can compare and interpret mechanical properties of different fabrics e.g. by analysis of stress strain test results. Students have well-grounded understanding about individual application areas and markets of fabrics.
Yarn Technology

Content

History of Spinning

Filament Yarns
- Spinning
- Texturising
- Determinations

Differences in Staple Fiber Productions
- Short Stapel Spinning
- Long Staple Spinning (Worsted Spinning, Half Worsted Spinning, Carded Wool Spinning)

Processes of Staple Fiber Spinning
- Blowroom
- Carding
- Drawing
- Combing
- Roving Production
- Spinning Processes (Ring-, Rotor-, Airjet-Spinning)
- Spulen

Calculations in Spinning
- Yarn Fineness
- Drafts
- Fibers in Yarn Cross Section
- Yarn Twist

Literature

The Rieter Manual of Spinning (Werner Klein)
- Volume 1: Technology of Short-staple Spinning - Volume 2: Blowroom & Carding
- Volume 3: Spinning Preparation
- Volume 4: Ring Spinning
- Volume 5: Rotor Spinning
- Volume 6: Alternative Spinning Systems
- Volume 7: Processing of Man-Made Fibres
Fabric Technology

1. Introduction:
- Definition of "textile" und "fabric", classification of fabrics, fabric analysis procedure, meaning of fabric analysis

2. Woven fabrics:
- summary of common weaving and weaving preparation processes
- Introduction to basic weaves and to weave diagrams
- composition and structure of woven fabrics
- properties of woven fabrics (wear resistance, E-modulus, anisotropic character of properties)
- special weaving processes (leno fabrics, terry fabrics, corduroy, double plush fabrics, gripper axminster, gobelins/tapisserie)

3. Knittings:
- summary of weft knitting and warp knitting processes
- stitch formation, patterns and patterning elements (stitch, tuck, floating, filling thread)
- needle types (bearded, latch and compound needles)
- properties and stitch arrangement of jersey, double jersey and purl knitting
- composition and structure of knittings
- properties of knittings and applications

4. Non-wovens:
- summary of web formation processes (mechnaical, aerodynamical, hydrodynamical web formation and spunlaying)
- summary of web bonding processes (felting, needle punching, spunlacing, chemical bonding and thermal bonding)
- composition and structure of non-wovens
- properties and applications

5. Stitch-bondings
- invention and history of stitch-bondings,
- summary of selected stitch-bonding processes (Malimo, Maliwatt, Malivlies, Kunit, Mulktknit),
composition and structure of stitch-bondings
- properties and applications

6. Narrow woven fabrics
- summary of manufacturing methods (traditional shuttle loom, modern needle loom)
- weft insertion principle and fabric character od needle loom fabrics
- selvage formation with and without auxiliary threads
- applications of narrow woven fabrics

7. Braids
- summary of braiding processes,
- composition and structure of braided fabrics
- difference between lace and cord braiding machines
- function and task of horn gears and of carriers
- properties and applications of braids

8. Tuftings
- history of tuftings, reinvention and first industrial mass production
- basic manufacturing processes
9. Bobinets/Tulle
- variations and classification of bobinets,
- summary of bobinet manufacturing processes,
- composition and structure of bobinets,
- properties and current applications of bobinets and tulle,
- difference between genuine bobinets and warp knitted "tulle"fabrics

10. Miscellaneous fabrics
- summary of miscellaneous fabrics (nets, scrims, flocked fabrics),
- composition and structure of miscellaneous fabrics, properties and applications

Literature

Eberle et. al.: Clothing Technology, Verlag Europa Lehrmittel, Haan-Gruiten 1999
Crawshaw, G.: Carpet Manufacture, Published by Wronz Developments, Christchurch, New Zealand, 2002
Büsgen, A.: Terms of fabric technology (dictionary), Intranet, Faculty of Textile and Clothing/ Niederrhein University,
Transfer_Dozenten/Buesgen/fabric technology/english_german.xls
Transfer_Dozenten/Buesgen/fabric technology/deutsch_englisch.xls
### Module: TCM-40: Mathematics

- **Language**: English
- **Responsible**: Prof. Dr. Rudolf Voller
- **Workload**:
  - **HpW**: 60h presence
  - **CP**: 43h preparation and follow-up work (exercises, literature, tutorials)
  - **P**: 22h preparation for examination

#### Lectures

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#### Examinations

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#### Precondition

- Schulmathematik bis Klasse 12 (Fachabitur)
- English Language Level CEF B2
General Aims of Module

In this module the knowledge in mathematics is updated, such that the students know about the basics in vector analysis and analysis at all. They are able to apply this to textile and clothing specific applications as well as to economic problems. Furthermore they can model and solve linear optimization problems.

Business Mathematics

Content

Set Theory, Sets of Numbers
Sequences, Limits
  Arithmetic and geometric sequences and series
  Applications in financial mathematics (Interests, Depreciation)
Functions of one variable
  Zeroes of polynomials, Horner's scheme
  Exponential function and Logarithm
  Net present value, Future value, Annuity, Amortization
Trigonometric Functions
Vector Analysis and Matrix calculation
Linear Programming
Differential and Integral Calculus
  Application of differential and integral calculus in economics

Literature

Dadkhah, K.: Foundations of Mathematical and Computational Economics
Antony Croft, Robert Davidson: Mathematics for Engineers, Prentice Hall,

http://www.maths.gla.ac.uk/~kal/FINMATH_LECT.pdf
## Module

**TCM-50: Natural Sciences**  
*Naturwissenschaften*

### Language
English

### Responsible
Prof. Dr. Boris Mahltig

### Workload
- **HpW**: 6 CP  
- 90h presence  
- 40h preparation and follow-up work (exercises, literature, tutorials)  
- 20h preparation for examination

### Lectures

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<td>School knowledge in physics and chemistry; advanced technical college entrance qualification in mathematics, chemistry and physics</td>
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<td>TCM-52</td>
<td>Physics</td>
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### Remarks
General Aims of Module

A broad knowledge in natural sciences are absolutely necessary for generalists working in the area of textile- and clothing technology. The students gain broad knowledge necessary for understanding of technology- and economic-related lectures. The knowledge in natural science will be equalized to a level, which is necessary to understand textile technology and to evaluate processes in that field.

With physics the students enter the fundamentals of a scientific technical knowledge horizon, which at the same time enables them to judge physical concepts and to be able to choose for their own textile oriented tasks. Starting from basal physics contexts of the kinematics, kinetics and vibration theory, students should proof them in practical tests. The discrepancies between theoretical calculations and experimental results are presented such as, for example, diagrams and commented in reports. Students can critically assess their results by an error analysis.

Atomic models, types of chemical bonds and the concept of the amount of a substance are well known. The students are able to recognise the type of a chemical reaction and to do basic stochiometric calculations. They are also familiar with the most important functional groups in organic chemistry and the concepts of polymer chemistry. The students are able to use the concept of structure(effect-relation for the evaluation of textile materials. By use of this concept, they are able to select and evaluate suitable textile materials for specific applications. The relation of polymer chemistry and fiber/textile properties is known by the studens and enable them, to evaluate and select the right textile materials for various applications.

General Chemistry

Content

- atomic models, periodic table
- chemical bonds
- stochiometry
- solutions, concentrations
- oxidation and reduction
- acids and bases, pH-value
- chemical equilibrium
- kinetics

Literature

P. Paetzold: Chemie, Walter de Gruyter, 2009
E. Wawra, H. Dolznig, E. Müller: Chemie verstehen, UTB-Verlag, 2009
Organic Chemistry

Content

- carbon bonds
- nomenclature
- alkanes
- alkenes, isomers
- constitution isomers, stereo isomers - aromatic hydrocarbons
- alcohols, aldehydes, ketones
- carboxylic acids, esters
- amines, amides, aminoacids
- concept of structure/effect relation
- chiral compounds
- sugars
- polymers
- biopolymers
- polysaccharides

Literature


Physics

Content

Theoretical part:
- Introduction in kinematics, kinetics and vibration theory

Practical part:
- Free Fall
- System acceleration
- Momentum conservation
- Axial moment of inertia

Literature

Module  
TCM-60: Information Technology  
*Informationstechnologie*

Language  
English

Responsible  
Prof. Dr. Klaus Hardt

Workload  
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<th>Name</th>
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- **60h** presence
- **60h** preparation and follow-up work (exercises, literature, tutorials)
- **30h** preparation for examination

Remarks

Examinations

<table>
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<tr>
<td>TCM-60</td>
<td>Information Technology</td>
<td>Pr</td>
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27.11.2017
Information technology today is an indispensable part of virtually all areas of work. This ranges from the traditional office applications to a variety of specialized applications for design and construction, CAD / CAM systems for production planning and control, and all variations of business processes.

In the module "Information technology" the students get a broad foundation of knowledge and skills, which they may apply in the further study in these fields of specialization. Given the complexity of today's information systems and the speed of further developments it is essential that these basics include both the hardware, system software and application software.

Students therefore learn about the digital fundamentals and components of a computer system, understand the basic functionality and may derive from it actual and future performance data. This enables them to specify system specifications and to perform system comparisons, but also recognize the technical limitations of use. They can use the standard office applications, word processing, spreadsheet calculation and presentation and apply those also in more complex situations.

The Internet and eBusiness, which is in general defined as _doing business electronically_ has changed significantly all business processes in almost all organisations and is today an essential part of commerce with end customers. Commercial transactions between business partners, often classified as _business-to-business_ is a vital part of modern value networks. Especially in the field of textile and clothing online shops and multi channel retailing is gaining increasing importance.

Therefore students gain in this module the following competences. Students understand the technical principles of the communication in the internet. They are able to describe the changes of business processes due to electronic communication. They are able to identify opportunities and risks of this transformation. Furthermore they develop a deep understanding of underlying data and the methods and procedures to collect, process, evaluate and present this information for necessary management decisions. Almost inherent this affects the field of copyright protection and privacy. Students understand its importance, vulnerabilities and methods to protect against threads.

Without cryptographic methods no secure communication would be possible. Therefore an introduction in this field enables the students to understand the most important requirements for a secure transaction as well as the methods to meet these requirements. Especially they understand the basics of public key encryption and digital signatures.
Computer Applications

Content

Basics of Computer systems

- Information processing by computer, including binary information handling, number systems and character encoding
- computer architecture and modern concepts of ubiquitous computing and augmented reality
- computer peripherals including input/output systems and storage devices
- basics of operating systems and Windows user interface
- file system and backup procedures
- text processing with WORD
- spread sheet calculation with EXCEL
- color
- basics of computer graphics, especially 3D graphics

Literature

own script.

several eLearning modules are available on the eLearning platform moodle and may be used at any time.

in addition several Internet based sources which are accessible free of charge are integrated in the lecture.
Internet and eBusiness

Content

Basic internet technology
- Internet history
- TCP/IP protocol
- domain name system and addressing

Internet services, especially
- email
- WWW
- Multimedia elements

eBusiness
- Social and demographic information about internet users
- Economic aspects of eBusiness
- Value chain and eBusiness processes according to the scheme of E. Porter
- Partners in eBusiness
- Business models
- Electronic auctions
- digital products
- electronic catalogues
- electronic market places
- eProcurement
- mCommerce
- e-marketing and website design
- implications for Customer Relationship Management (CRM)

Security aspects of internet communication
- requirements for a secure communication
- symmetric and public-key encryption
- Hash fuction and digital signatures

Privacy
- threats
- protection measures

Literature

Andreas Meier, Henrik Stormer: eBusiness & eCommerce - Managing the digital Value Chain, Springer-Verlag, 2009

### TCM-70: Business Sciences

*Wirtschaftswissenschaften*

<table>
<thead>
<tr>
<th>Language</th>
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<td>Responsible</td>
<td>Prof. Dr. Gerrit Heinemann</td>
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#### Lectures

| Name: | Economics |
| Teacher: | Prof. Dr. Heinemann, Gerrit |
| Precondition: | English |

| Name: | Business Administration |
| Teacher: | Prof. Dr. Ständer, Ute |
| Precondition: | none |

#### Examinations

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<td>TCM-70</td>
<td>Business Sciences</td>
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</table>

### Remarks
General Aims of Module

Business Science is relevant for all textile and fashion companies. Those enterprises are first of all confronted with scarcity and utility. Normally Business Science consists of economics and business administration. Economics considers the economy as a whole and is following two different perspectives: Microeconomics and Macroeconomics. Macroeconomics is focusing the birds point of view and reflects the country as an economical system. Microeconomics is focused on the frogs perspective, which stands for single units like households and companies. It is more or less reflecting already the business administrative perspective. Contents of business science are for example basic ideas of economics and production, factors of production, scale and location of production, basic ideas of demand and supply, elasticity of price and demand, competitive and and monopoly markets.

Exchange and money, distribution of wealth, rewards to factors, International trade, the balance of payments and free trade areas. Export and import is also part of the companies basic functions in form of global sourcing/purchasing/procurement and international sales/marketing. In form of extended working banks production is also part of this game. By this business administration cares about all functions and decisions made in companies as well as the relevant management issues.

The students learn the key issues, basic contents and methods of economics as well as business administration. They can distinguish micro- and macroeconomics and understand, how to deal with scarcity. They are able to allocate resources on a simple basis using the ppf-curve. They are also able to explain the quantitative aspect of an economy using the gdp equation. They understand the functions and role of money and how to supply money to markets. The can also explain the inflation, the inflation index and also the purchase basket, which is used to measure inflation rate. The students are able, to explain a recession, the reason of recessions and in how far governments can fight recessions. They distinguish and compare the risks and benefits of monetary and fiscal policy. Market models will be also part of the student’s knowledge. They are able to develop a demand curve as well as a supply curve and explain the market equilibrium. All together the students understand the rules and issues of market cycle models. They know, how a household can achieve equilibrium levels and balanced results. Beside the economical knowledge the students learn also the most relevant issues of business administration and management science. They understand, in how far the economical environment is influencing the companies decisions. They are able to distinguish the basic types and formats of companies and their specific value chains. They are also able to explain the core processes and their changes due to the digital role. The students can distinguish the main functions and all their specific instruments. They know, how management is deciding and output can be optimised. They also understand the difference between structures and processes. They are able to use also their basic knowledge practice.
Economics

## Content

I. Role and Importance of The German Economy
- Facts and Figures
- Global role
- Relevance for textiles

II. Economics - The Science of Dealing with Scarcity
- Specifics of scarcity
- Micro- versus Macro Economics
- Market Economies

III. Determining Production Possibilities and Allocating Resources
- PPF Curve
- Allocation decisions
- Effect of technological developments

IV. Measuring the Macroeconomy
- GNP and GDP
- Circular Flow Diagram
- Expenditure Equation for Totaling up GDP

V. Inflation
- Functions of money
- Determining inflation rate
- Market basket

VI. Understanding Recessions
- Reasons for recessions
- Effects of recessions
- Short run and long run effects

VII. Fighting Recessions
- The Keynesian Model
- Fiscal policy
- Monetary policy

VIII. Supply and Demand as Basis of Microeconomics
- Kinds of demand functions
- Kinds of supply functions
- Unbalanced market situations

IX. Utility-Maximizing Consumers versus Profit-Maximizing Firms
- Determining utility
- Utility maximization
- Profit-Maximizing Firm as Core of Capitalism

X. Companies as Backbone of an Economy

## Literature

### Business Administration

#### Content

**Basics**
- What is business?
- Factors of production
- Private enterprise system

**Starting a small business**
- Definition of small businesses
- Contribution of small businesses to the economy
- Basic forms of business ownership
- The business plan: a foundation for success
- Advantages and disadvantages of small businesses

**Managing a business**
- Managing financial procedures (Accounting, Controlling, Investment appraisal, Finance)
- Managing operations (The operations function, Process design, Capacity planning, Inventory management, Work force management, Quality management)
- Marketing strategies (Selecting a target market, Market segmentation, Marketing mix, Pricing strategy, Distribution strategy)
- Human resource management (Manpower planning, Recruitment and selection, Training and developing, Compensating employees, Terminating employees)

**International business**
- Competing in global markets (What is international business?, Risks in international business, What motivates firms to go international?)
- Barriers of international trade (Social and cultural differences, Economic differences, Political and legal differences, Trade restrictions)
- Going global (Importers and exporters, International agreements, Offshoring, International direct investment)

#### Literature

Akwetey, Lawrence Mensah: Business Administration for Students and Managers, Trafford 2011


## Module

**TCM-80: Textile Technologies**

*Textile Technologien*

### Language

English

### Responsible

Prof. Dr. Thomas Weide

### Workload

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### Remarks

4

### Examinations

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### Lectures

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**Precondition:**

- Non-wovens: none
- Spinning: Content of Lecture Yarn Technolgy

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27.11.2017
General Aims of Module

The students are able to draw principles of the different nonwoven production lines and can explain the different fiber preparation, web forming and web bonding technologies. With given requirements of the final product the students can judge the best fiber material, web forming process and web bonding process for this application. The students can also analyse a nonwoven and explain the used web forming and web bonding technologies.

The students can draw and explain the different spinning technologies and know the advantages and disadvantages of the different spinning technologies. With a given application the students can compare the different spinning technologies, find the best technology and the right setting of the machines. Also the students are able to analyse a given yarn by its structure, can explain which technology was used and can rate the yarn quality.
Non-wovens

Content

Basics of Nonwovens
- Definitions and Determination
- Classifications of Nonwovens
- Fiber Orientations

Raw Materials of Nonwovens
- Important Fiber Properties
- Nonwoven Fiber Consumptions

Fiber Preparation for Dry Lay Process
- Technology
- Machines and Processes
- Specific Features of Fiber Preparation for Nonwovens Production

Mechanical Web Forming
- Technology
- Carding Processes
- Construction and specific Features of Nonwoven Roller Card
- Cross Laying Process
- Web Properties
- Applications
- Production Calculations

Aerodynamic Web Forming
- Technology
- Machine Structure
- Specific Features (High-Loft-Roller and Deflector-Shild)
- Web Properties
- Applications

Hydrodynamic Web Forming
- Technology
- Machine Structure
- Web Properties
- Applications

Web Forming by Extrusion Process
- Technology
- Machine Structure
- Meltblown-Technology
- SMS-Technology

Web Bonding Basics
- Classifications
- Adhesive and Cohesive Bonding

Principles of mechanical Web Bonding Technologies
- Needling
- Looping
- Entangling
Principles of thermal Web Bonding Technologies
- Hot Air Bonding
- Calandering

Principles of chemical Web Bonding Technologies
- Impregnation
- Spraying
- Printing
- Foaming

Typical Applications depending on NW-Technologies

Literature

Spinning

Content

Ring Spinning
- Technology
- Settings
- Compact Spinning
- Siro Spinning
- Core Yarn Spinning
- Yarn Structure
- Yarn Quality and Properties

Rotor Spinning
- Technology
- Spinnbox Structure and Spinning Components (Combing Roller, Rotor, Take-Up-Navel, Torque-Stop)
- Settings
- Piecing Process
- Yarn Structure
- Yarn Quality and Properties

Airjet Spinning
- Differences between different Airjet Spinning Technologies (airjet false twist and airjet real twist spinning)
- Technology
- Construction of Spinning Nozzle
- Settings
- Piecing Process
- Yarn Structure
- Yarn Quality and Properties

Other Spinning Processes
- Friction Spinning
- Self-Twist-Process
- Wrap Spinning
- Bobtex-Process

Yarn Quality
- Yarn Parameter
- Rating according to Uster-Statistics

Production Calculation

Literature

The Rieter Manual of Spinning (Werner Klein)
- Volume 1: Technology of Short-staple Spinning
- Volume 2: Blowroom & Carding
- Volume 3: Spinning Preparation
- Volume 4: Ring Spinning
- Volume 5: Rotor Spinning
- Volume 6: Alternative Spinning Systems
- Volume 7: Processing of Man-Made Fibres

C Lawrence: Advances in Yarn Spinning Technology (Woodhead Publishing)
Module: TCM-90: Communication and Teamwork

Kommunikation und Teamwork

Language: English

Responsible: Prof. Dr. Walter Harsch

Workload:
- HpW: 6
- CP: 6
- 90h presence
- 40h preparation and follow-up work (exercises, literature, tutorials)
- 20h preparation for examination

Lectures

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Precondition: None

Name: Project Management

Teacher: Prof. Dr. Harsch, Walter

Precondition: None

Name: Intercultural Management

Teacher: Prof. Dr. Schwarz-Pfeiffer, Anne

Precondition:

Examinations

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<td>TCM-92</td>
<td>Project Management</td>
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<td>TCM-93</td>
<td>Intercultural Management</td>
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Remarks
General Aims of Module

Cooperation between people is a basic requirement for successful work. This includes, for example, mutual development and the realization of new solutions in team work as well as the convincing presentation of the achieved results. In the textile and clothing business, which is a very international industry, intercultural aspects should be considered to a high degree. In the module "Communication" the students are furnished with a broad basis of knowledge and skills, which they may apply and improve in numerous other courses in their studies.

Students therefore learn about essential elements of conducting presentations, proceedings and working methods for having meetings, and about planning and performing projects. In such situations as well as in discussions and negotiations they are able to take into account different mentalities of different countries and achieve optimum results which are characterized by a high acceptance of all parties involved.

Communication and Presentation

Content

- Basics of communication
- Non-verbal communication
- Verbal communication
- Developing communicative competence
- Communication models: basics and critical comparison
- Communication in intercultural contexts
- Group exercises on communication
- Basics and methods: feedback
- Group exercises on feedback
- Basics for the design of presentations
- Design of presentation templates
- Performing presentations
- Dealing with questions in presentations
- Group exercises on presentations

Literature

Project Management

Content

- Basics of Project Management
- Organizational structures of Project Management
- Tasks and competencies of involved parties
- Proceeding and working methods for project planning and project realisation (e.g. network diagrams, bar charts, staff capacity diagrams)
- Group exercises for project planning

Literature

Harsch, W.: Manuscript
Harsch, W.: Manuscript of course, version of the relevant semester.
Intercultural Management

Content

Introduction
- Definition of culture
- Meaning and importance of culture
- Values

Cultural models according to Lewis, Hall, Gesteland and Hofstede
- Classifications
- Country-specific application scenarios

Culture-specific characteristics of communication

Influence of culture on management tasks
- Planning
- Organisation
- Staff
- Leading
- Control

Intercultural teams and collaboration

Literature

Geert Hofstede: Lokales Denken, globales Handeln, dtv-Beck Verlag, 3. überarb. Aufl. 2006
Dagmar Kumbier / Friedemann Schulz von Thun (Hg.): Interkulturelle Kommunikation: Methoden, Modelle, Beispiele, Rowohlt Taschenbuch Verlag, Reinbek bei Hamburg 2006
**Module**

**TCM-100: Basics of Clothing**

*Grundlagen der Bekleidung*

**Language**

English

**Responsible**

Prof. Dr. Karin Finsterbusch

**Workload**

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<td>TCM-102</td>
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<td>TCM-103</td>
<td>CAD Construction of Garments</td>
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**Lectures**

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**Remarks**
General Aims of Module

In the modules basic of clothing Students gain consistent basic knowledge in the fields of clothing technology and as well as computer aided construction of garments on which Continuing studies and evaluation in clothing technology and construction of garments can be established in clothing technology students will get an overview of the meaning and the application fields with manufacturing of textile materials as well as basic knowledge about processes, machines and equipment to manufacture of textile products and their links and interfaces with preliminary textile stages.

Im Modul Bekleidungstechnische Grundlagen erwerben die Studierenden einheitliche Grundkenntnisse in den Bereichen der Konfektionstechnologie und der manuellen sowie der rechnergestützten Bekleidungskonstruktion, auf denen die weiterführenden Studien- und Prüfungsgebiete der Konfektionstechnologie und der Bekleidungskonstruktion aufbauen.

Die Studierenden können:

Students are able to describe and distinguish "design", "pattern construction", "grading" and "lay planning"
They know what happens inside the process of "Pattern Making"
They are able to figure out the historical development from manual pattern making to CAD - computer-aided design.
Students can describe selected pattern making systems and their assets and drawbacks.
Students are able to determine the measurement system related body measurements from individual bodies and calculate finished measurements for selected basic blocks.
They can work with standard measurement tables for men and women and the relations to figure types and target groups.
Students can generate selected basic blocks for men and women wear in selected pattern making systems and create simple style developments on the base of basic blocks.
After participating the lecture related practical training "CAD Construction of garments" students can use a selected CAD-System for pattern making in all departments of technical textiles and clothing
Students can work with measurement charts included in the CAD-System
They can develop blocks and styles within the CAD-System
Students can grade pattern pieces and use the lay planning part of the CAD-Systems
Students can create the possible output of product related information for different departments of a company

Die Studierenden können die Begriffe "Design", "Schnittkonstruktion","Gradieren" und "Schnittbildplanung" beschreiben und wissen, was im "Schnittkonstruktiven Prozess" stattfindet.
Sie sind in der Lage, die historische Entwicklung der manuellen und rechnergestützten Schnittkonstruktion darzustellen.
Sie können ausgewählte Schnittkonstruktionssysteme beschreiben und ihre Vor- und Nachteile für verschiedene Anwendungen bewerten.
Die Studierenden können vom menschlichen Körper Körpermaße abnehmen und daraus Konstruktionsmaße berechnen und können kritisch mit Größentabellen der DOB und HAKA arbeiten,
Sie können Grundkonstruktionen/Basiskonstruktionen für DOB und HAKA nach ausgewählten Konstruktionssystemen erstellen und daraus einfache Modellkonstruktionen entwickeln.

Sie können nach dem Besuch des zugehörigen Praktikums "CAD Construction of Garments" ausgewählte CAD- Systeme für die Bekleidungskonstruktion und die Konstruktion Technischer Textilien nutzen, mit Maßtabellen am CAD- System arbeiten, Modellkonstruktionen am CAD- System erstellen sowie Schnitte gradieren und Schnittbilder erstellen.
Clothing Technology

Content

The course "Clothing Technology" provides an overview of the processes, technologies and machines of the manufacturing of textile materials.

Specific content:
- Introduction: textile chain, textile and clothing industry - facts and figures, textile product groups
- Cutting room: marker making, spreading and cutting technologies and machines
- Preparation for sewing and Fusing
- Joining technology sewing: sewing machines, sewing tools, stitch types, seam types
- Ironing and finishing: processes, machines
- Alternative joining technologies (e.g. welding, riveting)

Literature

Autorenguppe: "Clothing Technology: ... from fibre to fashion"

In addition a detailed script is offered
Pattern Making

Content

- Historical background of the development of classical manual and computer aided pattern design
- Survey of different pattern design systems
- Definition of standardized terms for the pattern design in different pattern design systems
- Critical use of ladies and men's body measurement tables
- Calculation of the design measurements in different pattern design systems
- Basic design, style design and development of final pattern for selected products of ladies and men's wear
- Design of leg clothing of different styles for ladies and men
- Design of bodice clothing of different styles for ladies and men
- Design of selected sleeve styles
- Use of CAD-Systems for pattern making of clothing and technical textiles
- Survey of the different, mostly used in practice, processes of pattern development
- Demonstration of computer aided pattern development with GRAFIS

- Geschichtlicher Hintergrund der klassischen manuellen und rechnergestützten Bekleidungskonstruktion
- Überblick über verschiedene Schnittkonstruktionssysteme
- Definition von Fachbegriffen in verschiedenen Schnittkonstruktionssystemen
- Kritische Anwendung von DOB- und HAKA Großentabellen
- Berechnung von Konstruktionsmaßen nach verschiedenen Schnittkonstruktionssystemen
- Entwicklung von Grund-, Modell- und produktionsreifen Schnitten für ausgewählte Erzeugnisse für Damen und Herren
- Konstruktion von Beinbekleidung verschiedener Art für Damen und Herren
- Konstruktion von Rumpfbekleidung verschiedener Art für Damen und Herren
- Ausgewählte Ärmelkonstruktionen
- Anwendung von CAD-Systeme für die Schnittkonstruktion von Bekleidung und von Technische Textilen
- Überblick über die am häufigsten in der Industrie genutzten Systeme
- Demonstration mit dem CAD-System GRAFIS

Literature

Finsterbusch, Karin; Mosinski, Erich; Pohl, Herbert: Grundlagen der Bekleidungskonstruktion - System OPTIKON; Hochschule Niederrhein, 4. neubearbeitete und erweiterte Auflage, englischsprachig, 2001
Detering, Ute; Schierling, Rotraud: CONTEC - Bekleidungskonstruktion DOB, Ringbinder, Hochschule Niederrhein, 2003
Hillers, Eva u.a.: Bekleidungskonstruktion System OPTIMASS, Hochschule Niederrhein, 2001
Perkhozl, Ursel; Lärer, Dorothea: Von der Idee zur Serie; Dr. Felix Büchner; Handwerk und Technik; Hamburg, 1995
Amstrong, Helen Joseph: Patternmaking for fashion design, Harper Collins Publishers

Aufgrund der breiten Fächerung der Lehrinhalte wird zusätzlich mit frei zugänglichen Quellen im Internet gearbeitet. Siehe hierzu die detaillierte Aufstellung von Verweisen auf den Internetseiten der Lehrenden.

Zusätzlich wird den Studierenden ein detailliertes Skript angeboten

Due to the nature of the content reading is done with free available sources in the internet. A detailed listing of related links can be found on the homepage of the lecturer
CAD Construction of Garments

Objectives:
The lecture will transmit the knowledge to use a 2D-software for pattern construction, grading and marker making in industrial context.
After having successfully completed the lecture the participants will be able to create all production pieces of a garment style within the software - for all required materials - fabric, lining, interlining - and at the end build a print file on scale of 1:1 in individual or graded sizes.

Content:
The 2D Software for construction of garments CAD-System "Grafis"
- Historical progress of Grafis
- Working with collections and styles
- Creating measurement charts - standard and individual, body measurements and finished measurements
- Creating basic blocks and styles with variable values and calculated values
- Calling, using and adjusting interactive basic blocks
- Creating garment styles in different levels of development by the use of hereditary automatic
- Familiarization to all standard and interactive tools for style development
- Print of patterns
- Grafis grading - grade rule grading
- Marker making

Ziel der Lehrveranstaltung:
Kenntnisse im Umgang mit einer Software für die Schnittkonstruktion, Gradierung und Schnittbildlegen werden vermittelt.
Nach Absolvieren der Veranstaltung sind die Teilnehmer in der Lage, produktionsreife Modelle, d.h. alle zu dem Modell gehörenden Oberstoff-, Futter- und Einlageschnittteile am Bildschirm zu erstellen, die Schnittteile im Maßstab 1:1 auszuplotten und das Modell in unterschiedlichen Größen darzustellen.

Lehrinhalte:
Die CAD-Bekleidungskonstruktion wird mit dem CAD-System GRAFIS vermittelt.

- Historische Entwicklung von GRAFIS
- Arbeiten mit Kollektionen und Modellen
- Erstellung von Maßtabellen (Standard- und individuellen Maßtabellen)
- Aufruf von Grundkonstruktionen und Erstellung von Nullaufkonstruktionen
- Einstellung der im System implementierten interaktiven Konstruktionen
- Teilbearbeit - Arbeiten mit mehreren Teilen und Vererbungsmaschinen
- Modellerstellung auf der Basis verschiedener Entwicklungsstufen
- Erlernen aller Modellierungsfunktionen, wie z.B. Parallelen, Konstruktion von Punkten, Strecken und deren interaktiven Entsprechungen
- Kreisbögen, Rechtecken, Abnäherverlegung, Kurvenkonstruktion, Eckenbehandlung und deren interaktiven Entsprechungen
- Einsatz von Konstruktionsparametern und Berechnungsfunktionen
- Plotten, Drucken
- GRAFIS- Gradieren versus Sprungwertgradieren
- Schnittbildgebung

Literature
Friedrich, K.: GRAFIS- Handbuch, aktuelle Version
Finsterbusch, Karin; Mosinski, Erich; Pohl, Herbert: Grundlagen der Bekleidungskonstruktion - System OPTIKON; Hochschule Niederrhein, 4. neubearbeitete und erweiterte Auflage, englischsprachig, 2001
Hillers, Eva u.a.: Bekleidungskonstruktion System OPTIMASS, Hochschule Niederrhein, 2001

Zusätzlich wird den Studierenden ein detailliertes Skript angeboten
### Module
**TCM-110: Textile Chain**
*Textile Kette*

**Language**: English  
**Responsible**: Prof. Dr. Anne Schwarz-Pfeiffer  
**Workload**:
- **60h** presence  
- **43h** preparation and follow-up work (exercises, literature, tutorials)  
- **22h** preparation for examination

### Lectures

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### Precondition:

**Teacher:**

Prof. Dr. Schwarz-Pfeiffer, Anne

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### Examinations

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### Remarks
General Aims of Module

In a first project period students will get theoretical and practical knowledge in all steps of the textile chain from fibre production to the manufacturing of a final product. The aim of the subject is to apply gained knowledge during lectures in the first semester in practical session. Students are able to develop (semi-)finished textile products, analyse them critically in terms of quality and producibility. Finally they are able to adapt their design accordingly.

Above that, students teams will be formed in order to develop and train the ability for interdisciplinary project work.

The aims of the single steps along the textile chain are described in the following.

Spinning:
The students will recognize the fundamental work steps of the yarn production in practice. Students will recognize the difference between the most important spinning-processes. Students will learn to assess the yarn quality.

Weaving:
Students shall learn basics about the structure, production methods, properties and applications of woven fabrics.

Knitting:
Classification of knitting machines and knitted fabrics.

Finishing:
It is expected to give the students a survey about finishing technologies. Selected methods will be applied by the students to produce the planned product.

Clothing Manufacturing:
Students will get basic knowledge about the manufacture of clothing products in design, production engineering, cutting, sewing and final control with regard to quality requirements.
Textile Chain

Content

Spinning:
- Find out all necessary work steps for the production of a ring and rotor yarn
- Design and produce a suitable ring and rotor yarn
- Determine the most important fibre and yarn parameters
- Main emphasis:
  - visual and technical classification of the cotton
  - calculation of the essential technological parameters
  - explanation of the fundamental ring and rotor spin technique
  - assessment of the yarn quality

Weaving:
- Analysis of woven fabrics
- Basic weaves
- Color-and weave effects
- Properties and Applications

Knitting:
- Laboratory tour with explanation of all knitting machines
- Knitting on manual looms
- Field trip in shops with knitted fabrics
- Study of advertisements for knitted fabrics

Finishing:
Survey of the machines which can be used at the faculty:
- dyeing machines like jiggers, jet dyeing machines
- printing machines
- sizing machines
- stenter frame
- foulards
- coating machines
- machinery for dry finishing
  - raising
  - shearing
  - cutting

Clothing Manufacturing:
- Students will get basic knowledge about the manufacturing steps as well as equipment and machinery
- Practical work during producing a clothing product considering the fit, the accuracy of manufacture and quality aspects

Literature

Eberle, Hermeling, Hornberger, Menzer, Ring: Clothing Technology....from fibre to fashion, Verlag Europa-Lehrmittel, Haan-Gruiten, 2007
Module: TCM-120: Accounting

Language: English

Responsible: Prof. Dr. Ute Ständer

Workload:
- 60h presence
- 43h preparation and follow-up work (exercises, literature, tutorials)
- 22h preparation for examination

Lectures

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Remarks
General Aims of Module

Managing the financial procedures is perhaps the most important task when running a business, as without sufficient financial resources and without achieving profits no business can survive. Accounting forms an important part of managing the financial procedures of a company. The purpose of accounting is to register, monitor, and analyse all company affairs numerically.

By recording all money flows and flows of goods in a company external parties like suppliers, banks, or investors are informed. Based on legal regulations, every company is obliged to record all transactions and to prepare the financial statements. These tasks of accounting are called financial accounting.

Accounting also has to inform the company itself about profitability, cost and price calculation. Moreover, standard costs and budgets must be planned. This part of accounting is called managerial accounting.

The students have got an overview about all relevant topics of managerial and financial accounting. They know the differences between managerial and financial accounting and their respective goals. They know the components of financial statements. They know the double entry system and can record transactions in the journal and the ledger by themselves. They understand the purpose of adjusting entries and can record them. They are able to close the books and to prepare the financial statements after recording all transactions.

They are able to apply various cost accounting methods in order to calculate unit cost and know which type of business apply the respective method. They know various pricing strategies and are able to calculate the operating result based on absorption costing as well as based on variable costing. They know the importance of standard costs and can calculate them. They can calculate and interpret differences that may occur in the following variance analysis. Finally, they are familiar with the basics of budgetary planning.
Managerial Accounting

Content

Basics of Managerial Accounting
- Definition of Managerial Accounting
- Comparing Managerial and Financial Accounting
- Goal of Managerial Accounting
- Cost Terms (Variable, Fixed and Mixed Cost, Product and Period Cost)
- Cost-Volume-Profit Analysis (Break-Even Point, Margin of Safety, Contribution Margin)

Job Order Costing
- Characteristics
- Job Cost Sheet
- Accumulating Direct Job Cost
- Accumulating Manufacturing Overhead
- Under-/Overapplied Manufacturing Overhead
- Job Order Costing for Service Companies

Process Costing
- Characteristics
- Calculating Unit Cost

Activity-Based Costing
- Definitions
- Classification of Activities
- Activity-Based Unit Cost
- Evaluation

Pricing
- The Profit-Maximizing Price
- Cost-Plus Pricing
- Target Costing
- Pricing Special Orders

Variable Costing
- Absorption Costing versus Variable Costing
- Effects of Deviating Production and Sales Volume

Standard Cost
- Setting Standard Cost
- Variance Analysis

Budgetary Planning
- Budgeting Basics
- Preparing the Master Budget

Literature

Davis, Charles E./Davis, Elizabeth: Managerial Accounting, 2nd ed., Wiley & Sons 2014
Financial Accounting

Content

Introduction
- What is Accounting?
- Historical Development
- Who Uses Accounting Data?
- Conventional Accounting Rules (Boundary Rules, Measurement Rules, Ethical Rules)
- International Accounting Standards

Basics of Accounting
- The Basic Accounting Equation
- Using the Accounting Equation
- Components of Financial Statements

The recording process
- The Account
- The Journal
- The Ledger
- Posting
- The Trial Balance

Adjusting the Accounts
- Basics of Adjusting
- Types of Adjusting Entries
- The Adjusted Trial Balance
- Preparation of Financial Statements
- Alternative Treatment of Prepaid Expenses and Unearned Revenue

Closing the Books
- Temporary and Permanent Accounts
- Preparing Closing Entries
- The Post Closing Trial Balance

The Classified Balance Sheet
- Non-current Assets
- Current Assets
- Equity
- Non-current Liabilities
- Current Liabilities

Literature

Dyson, J. R.: Accounting for non-accounting students, 8th ed., Pearson 2010
Module: TCM-130: Law

Language: English

Responsible: Prof. Dr. Ute Ständer

Workload:
- HpW: 2 CP: 2
- 30h presence
- 13h preparation and follow-up work (exercises, literature, tutorials)
- 7h preparation for examination

Lectures

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Examinations

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Remarks

27.11.2017
General Aims of Module

Employment and Labour Law is a special right concerning the relationship between employers and employees. It especially contains privileges for employees as the weaker contracting partner like the entitlement to paid leave, continued remuneration in case of sickness, and, subject to certain conditions, general and special dismissal protection.

The students know the sources of and differences between Employment and Labour Law, the order of rank of the sources of law and important acts. Concerning Employment Law they know the steps of the hiring process and can formulate a job advertisement in accordance with the General Equal Treatment Act. They know the duties of employers and employees during the employment relationship as well as at its end. The students know the reasons for terminating employment relationships and especially the preconditions for an orderly dismissal as well as for a dismissal for cause. They know the regulations of the Dismissal Protection Act. In each case they are able to solve simple case studies by applying the acquired knowledge.

Within Labour Law they know the collective bargaining parties and the basic concepts of the collective bargaining law. They can evaluate if a strike is legal and know the procedure of industrial action. Finally, they are familiar with the basics of the Works Constitution Act and know the different rights of participation of the works council in case of various business decisions.
Labour and Employment Law

Content

Fundamentals
- Definitions and System
- Legal Sources (Laws, Collective Bargaining Agreements, Works Agreements, Employment Contracts, Operational Practice, Case Law, Hierarchy of Legal Sources)

Employment Law
- Creation of Employment Relationship (Recruitment Process, Concluding Employment Contracts, Invalid Employment Contracts)
- Obligations of the Employee (Obligation to Work, Ancillary Obligations)
- Obligations of the Employer (Obligation to Pay Remuneration, Ancillary Obligations)
- Business Transfer
- Termination of Employment Relationship (Ordinary Dismissal, Dismissal for Cause, Dismissal for Variation of Contract, Termination Agreement, Obligations of the Employer and of the Employee in case of terminating an Employment Relationship)

Labour Law
- Freedom of Association (Definition, Trade Unions, Employers' Associations)
- Industrial Action (Basics, Strike, Lockout)
- Law Governing Works Councils (Basics, Rights of Participation and Codetermination, Works Agreement)

Literature

Däubler, Wolfgang: Arbeitsrecht, 11. Aufl., Frankfurt am Main 2015
Kirchner, Jens/Kremp, Pascal R./Magotsch, Michael: Key Aspects of German Employment and Labour Law, Heidelberg 2010
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Remarks
General Aims of Module

Theory and practise of quality control especially in focus of textile and clothing industry is topic of the lecture and practical exercises. The students can check the conditions for the performing textile testing, can explain the principle of the main physical tests and can perform these using suitable equipment. They can decide about the acceptance or rejection of the delivery and they can apply effective quality control during the production process. Further more students learn how to perform a risk analysis (Hazard Analysis). Communication skills and formalities of risk assessments by giving a presentation and doing an elaboration.

Statistics

Content

Descriptive Statistics
  Introduction
  Definitions and Basics
  Graphical Representation of Data
  Class evaluation, Histogram
  Correlation and Regression
Probability and Combinatorics
  Probability Calculation
  Random Variables and Distributions
  Parameter estimation, Confidence Interval
Statistical Inference
  Parameter Tests
  Adaptation Tests
  Two Parameter Tests
  Contingency tables, chi-square-test
  Outlier Tests
Quality Control
  Sampling Procedures
  OCC, AQL and RQL
  Control Charts
  Analysis of Variances

Literature

Bona, Mario: Statistical Methods for the Textile Industry, Textilia, Biella
Suhov, Kelbert: Probability and Statistics by Example I, Cambridge University Press
P. I.: Re-Sampling Methods, A Practical Guide to Data Analysis, Birkhäuser Verlag
Applied Quality Control

Content

- Definition of quality, components of quality management
- Basics of textile testing: sampling, conditions, humidity, test methods and criteria
- Physical testing methods for fibers, yarns, woven structures, knitted structures, fleece, clothing
- Evaluation of quality of textile products along the textile chain from fiber to end product in clothing, technical textiles or regular textiles under physical and chemical aspects
- Statistics as helpful tool
- Risk assessment / elaboration
- Presentation within the practical training
- practical training / testing textiles

Literature

ISO - Standards, ASTM-Standards concerning quality management, Textile testing of fibers, filaments, yarns, twists, fabrics, nonwovens, manufactured products, statistics, Beuth Publisher
Quality Control in the Textile Industry
Springer-Verlag London Limited 2007
DOI 10.1007/978-1-84628-498-4_10
Print ISBN 978-1-84628-497-7
Online ISBN 978-1-84628-498-4
Design principles for integrated automated statistical quality-control systems in manufacturing
A. S. Gorelov, V. V. Preis, V. B. Soskov in Russian Engineering Research (2008)
# TCM-150: Guided Projects

*Fachprojekte*

**Module**
- **TCM-150: Guided Projects**

**Language**
- English

**Responsible**
- Prof. Dr. Maike Rabe

**Workload**
- **HpW** 4 CP 5
  - 60h presence
  - 43h preparation and follow-up work (exercises, literature, tutorials)
  - 22h preparation for examination

**Examinations**
- **Sem.**
  - **Guided Projects**
  - HpW CP L SL Ex P Sem.
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**Precondition:**
- Prof. Dr. Rabe, Maike

**Remarks**

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General Aims of Module

The students are competent to handle textile technology, design or management related problems and to find problem solving procedures. They also know how to research for the necessary information and how to present the results in written and oral forms.

Guided Projects

Content

The Guided Projects cover different topics of the textile production chain: Subtopics out of the fields of spinning, weaving, knitting, finishing, manufacturing, design and management will be presented and elected according to modern problems in textile and clothing industry. The students elaborate these subtopics in teams and present their results in reports and presentations.

Literature
### TCM-160: Textile Production

*Textile Produktionstechnik*

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#### Lectures

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General Aims of Module

The learners are expected to be able to:
- Explain and distinguish between processes of weaving and knitting
- Determine and classify different samples of woven and knitted fabrics
- Deals with the design and the structure of woven fabrics, especially weave notations of woven fabrics.
- Know first short weave notations and the drawing of weave diagrams.
- Understand basic weaves, their advancements and their properties
- Explain and realize colour-and-weave effects, fancy weaves and backed fabrics as well as the draw up of the necessary weave diagrams
- Analyse and construct samples on basis of examples
- Identify different fabrics and classify them in single face, double face and purl
- List and structure different patterns in flat and circular knitting, warp knitting
- Explain the main machine parts in knitting
- Explain the stitch formation processes
- Build up loop drawings with needle notations/ lapping diagrams and vice versa
- Analyse exemplary pattern designs
- Define and describe different fabric forming technologies in knitting, such as flat and circular knitting, warp knitting

Weaving

Content

The lecture "Weaving" deals with the design and the structure of woven fabrics, especially weave notations of woven fabrics. Participants shall learn at first short notations and the drawing of weave diagrams. Basic weaves, their advancements and their properties should be understood. With the help of exercises, participants shall learn the realisation of colour-and-weave effects, fancy weaves and backed fabrics as well as the draw up of the necessary weave diagrams. Analysis and construction is practiced on basis of examples

- Short numerical notations
- Draw up of weave diagram
- weave notation, draft and liftingplan, stich
- Thread assimilation, yarn settings,
- basic weaves like plain, twill, satin
- Colour-and-weave effects
- Advanced basic weaves, modifications
- Fancy weaves
- Backed fabrics, additional weft system, weftdouble

Literature


Robinson, A.; Marks, R.: Woven cloth construction, The Textile Institute, Manchester 1973
Knitting Technology

Content

Knitting Application
- Consumption by end-use
- Examples for application
- Exercises

Knit Structures
- Fibres and yarns in knitting
- Stitches and structural elements
- Exercises

Needle arrangement, needles

Principles of stitch formation

Flat Knitting
- Machine elements of a flat knitting machine
- Parameters of flat knitting machines
- Selected pattern and needle notation
- Exercises

Circular Knitting
- Machine elements of a circular knitting machine
- Parameters of circular knitting machines
- Selected pattern and needle notation
- Exercises

Warp Knitting
- Machine elements of a warp knitting machine
- Parameter of warp knitting machines
- Lapping diagrams
- Selected pattern
- Exercises

Literature

including English Index

Youtube Video Channel (http://www.youtube.com/user/MarcusOliverWeber)
www.groz-beckert.com Produkte & Services Knitting Mediathek Animationen zur Maschenbildung
www.stoll.com
www.mayerandcie.com
www.warpknitting4u.com und www.youtube.com/user/RoBaempfer
Die Kettenwirkpraxis International (KPI), Zeitschrift für die Kettenwirkerei, Werkgemeinschaft Karl Mayer e. V., Obertshausen
Melliand Textilberichte International (MTBI)
Textile Networks
Textile Research Journal (TRJ)
Asian Textile Journal
Fibers and Textiles in Eastern Europe
Journal of the Textile Institute (JTI)
**Module**  
TCM-170: Sustainability  
*Nachhaltigkeit*

**Language**  
English

**Responsible**  
Prof. Dr. Lutz Vossebein

**Workload**  
- **HpW** 4  
- **CP** 5  
- **60h** presence  
- **43h** preparation and follow-up work (exercises, literature, tutorials)  
- **22h** preparation for examination

**Lectures**

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<th>Type</th>
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<th>HpW</th>
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**Precondition:**

**Examinations**

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<tr>
<td>TCM-170</td>
<td>Sustainability</td>
<td>Pr</td>
<td>written exam</td>
</tr>
</tbody>
</table>

**Remarks**
General Aims of Module

The learner is able to identify responsibilities of natural resources and name relevant laws and regulations. The students know the triple bottom line, a model for sustainability and CSR. Furthermore they know the most important social as well as environmental standards and their impact for the textile value chain and the most important CSR standards. The students know the basic theory of ecology and the origin of hazardous chemicals in textile and clothing industry. They are able to explain the green house effect and how to avoid relevant emissions within the textile chain. Furthermore they know about business specific eco labels within the textile production chain as well the basic principle of REACH. The communication will be improved by a team presentation about ecological relevant topics.
CSR Management

Content

Sustainability:
Dimensions of Sustainability: Economy / Ecology / Social aspects

Definition CSR:
Pyramide of Carroll / Triple Bottom Line / House of CSR
EU / OECD / UNGC / ISO 26000
Citizenship, Governance, Corporate Sustainability

CSR in the Textile and Clothing Industry:
Challenges: Rana Plaza / Detox
Responses: Fire Accord, Partnershop for Sustainable Textiles, ZDHC

The Textile Value Chain:
Environment: Chemicals, Pestizides, Energy Consumption, Transport Costs, Waste Management/Recycling
Social: Work conditions, ILO norms, Living Wages

Stakeholder Management:
Stakeholder, Wesentlichkeitsanalyse, NGOs
Transparency and Communication

Business Case CSR:
Vision, Strategy, Integration of CSR
Sustainability Reports, EU Guideline
Value Chain, Quality and Risk Management

Standards and Certificates:
Global Compact
Reach/EMAS/ISO14000/Bluesign
SA8000/Fairtrade/WRAP
IVN Best/GOTS/Oekotex

Outlook:
Business and Human Rights
Sustainable Development Goals
The unknown Customer

Literature

Idowu, Samuel O., Louche, Celine: Theory and Practice of Corporate Social Responsibility, 2011, Springer Verlag
Idowu, S., Frederiksen, C.S., Mermod, A.Y., Nielsen, M.E.J.: Corporate Social Responsibility and Governance
Theory and Practice, 2015 Springer Verlag
Idowu, Samuel O. / Schmidpeter, René, Fifka, Matthias S.: Corporate Social Responsibilty in Europe, 2015, Springer Verlag

http://ec.europa.eu/growth/industry/corporate-social-responsibility_de
http://www.unglobalcompact.org

27.11.2017
Environmental Management

Content

Students will learn why Environmental Management Systems are needed and how they could be implemented (e.g. acc. to ISO 14001ff). Therefore basic definitions of ecology and specific ecological footprints will be taught and calculated. Legislation and the role of environmental laws (on national and international levels) are explained. An overview of most important eco labels and ist role in industry and for consumers will be given. Students will learn how to evaluate specific governmental, non-governmental and private eco labels. With regards to cost reduction and energy savings different energy sources, waste water treatment plants and systems as well as exhaust air treatment possibilities and waste management will be discussed. The students have to give a team presentation of an environmental related topic.

Literature

DIN EN ISO 14001: Environmental management systems - Requirements with guidance for use (ISO 14001:2015); German and English version EN ISO 14001:2015
DIN EN ISO 14004: Environmental management systems - General guidelines on principles, systems and support techniques (ISO 14004:2004); German and English version EN ISO 14004:2010
DIN EN ISO 14050: Environmental management - Vocabulary (ISO 14050:2009); Trilingual version EN ISO 14050:2010
Rees, W.: Our ecological footprint
Journal: e.g. Melliand (English)
Module | TCM-180: Finishing  
| Veredlung 
Language | English 
Responsible | Prof. Dr. Maike Rabe 
Workload | HpW 4  
| CP 5  
| 60h presence 
| 43h preparation and follow-up work (exercises, literature, tutorials) 
| 22h preparation for examination 

| Lectures | 
| HPW CP | L SL Ex P Sem. | 
| Name: Finishing | 4 5 4 0 0 0 3 | 
| Teacher: Prof. Dr. Mahltig, Boris 
| Prof. Dr. Rabe, Maike | 
| Precondition: fundamental background knowledge in natural science, especially in chemistry, polymers and spectroscopy | 

| Examinations | 
| Code No. | Name | Type | Examination | 
| TCM-180 | Finishing | Pr | written exam |
General Aims of Module

The students know the technology and chemistry of pretreatment, dyeing printing and finishing of textiles. They are competent to select the right procedures for the most important fibres such as cotton, viscose, wool as natural fibres and polyamide, polyester, polyacrylics and elastic fibres. Furthermore, they have a good knowledge of textile finishing machinery for washing, pretreatment, dyeing, drying and fixation as well as finishing.

Finishing

Content

The subject comprises pretreatment, coloration and finishing.

1. Pretreatment:
   - Fundamental introduction into the pretreatment of cotton, wool and polyester
   - Fundamental introduction into the chemistry and technology of washing

2. Coloration:
   - Fundamental introduction to light, colours, dyes and pigments
   - Chromophores, auxochromes
   - Introduction to different categories of dyes according to the color index
   - Dye/fiber interaction; concept of dye anchoring and color
   - Coloration processes in dyeing and printing for natural and synthetic fibers
   - As specially: direct dyes, reactive dyes, acid dyes, basic dyes, vat dyes, azoic dyes, sulphur dyes, disperse dyes
   - Metal complex dyes / mordant dyes
   - Physical and chemical mechanism of dyeing and finishing
   - Processes and machines / continuous and discontinuous dyeing machines
   - Printing techniques and printing machines
   - Testing of coloration properties and fastness properties
   - Ecological aspects

3. Finishing
   - Concepts of chemical finishing and mechanical finishing
   - Hydrophilic effects and antistatic effects
   - Easy care effects and wash and wear effects
   - Flame retardant treatment
   - Water barrier textiles by coating, lamination and impregnation
   - Raising, shearing, calendaring

Literature

J. Shore: Cellulosics Dyeing, Society of Dyers and Colourists, 1995
W. Ingamells: Colour of Textiles, Society of Dyers and Colourists, 1993
<table>
<thead>
<tr>
<th>Lectures</th>
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**Precondition:**

**Examinations**

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<td>TCM-190</td>
<td>Projects</td>
<td>Pr</td>
<td>Elaboration</td>
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</table>

**Remarks**
General Aims of Module

The students acquire basic and practical experience in project planning and implementation and therefore they are able to manage new, complex tasks systematically and to develop practical solutions. The students have a wide range of approaches and working methods that can be used to handle all the necessary steps to plan and execute projects. A special focus is on working in the team. They know problems that can occur in different phases of the project, as well as their solutions, and train and expand their social, methodological and personal competences. They are able to apply acquired knowledge in special areas of textile and clothing technology, design and other engineering sciences, to deepen them and to develop new solutions.

Projects

Content

Students work on given subjects in teams of 9-10 students. The subjects are specified either by companies or from the university. The teams are formed by lot from all Bachelor study courses and branches.

- self responsible project planning and work in student teams
- application of project planning and working tools
- systematic development of specified goals and very restrictive time pressure and limited financial budget
- interim presentation of project plan and final presentation of project results

The participation at the frequent team meetings, the interim presentation and the final presentation is obligatory.

Literature

**Module**

**TCM-200: Study Work**

*Studienarbeit*

**Language**

English

**Responsible**

Prof. Dr. Klaus Hardt

**Workload**

<table>
<thead>
<tr>
<th>HPW</th>
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<td>30h</td>
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<td>63h</td>
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- 30h presence
- 63h preparation and follow-up work (exercises, literature, tutorials)
- 32h preparation for examination

**Lectures**

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<tr>
<th>Name:</th>
<th>Study Work</th>
<th>HPW</th>
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**Remarks**

Precondition: none

**Examinations**

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<td>TCM-200</td>
<td>Study Work</td>
<td>Pr</td>
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</table>

27.11.2017
General Aims of Module

Scientific working and scientific writing are essential skills every student has to adapt in the Bachelor studies. The making of a study work is a very good method to improve these skills.

Students are able to do literature research. They are able to work out individual solutions within a specific topic and describe their results in a scientific text.

Study Work

Content

Teachers of the department offer every semester specific topics for a study work. The students are able to select from this list and work out the study work on their own.

Literature

Individual literature according to selected topic.
Module: TCM-210: Electives

Language: English

Responsibility: alle Lehrende des Fachbereichs

Workload:

- HpW: 40 CP: 50

- 600h presence

- 433h preparation and follow-up work (exercises, literature, tutorials)

- 217h preparation for examination

Examinations:

<table>
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<th>Code No.</th>
<th>Name</th>
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<td>TCM-210</td>
<td>Electives</td>
<td>Pr</td>
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</table>

Remarks:

From the list of modules in the electives catalogue 10 modules must be selected.
General Aims of Module

A list of 16 modules is offered (see "TCM electives"). From this list students must select and pass 10 modules.

By this students can individually focus on desired fields of knowledge.

Individual Module Selection

**Content**

students may individually select from a list of offered lectures (see electives catalogues).

**Literature**

specific according to selected lecture
### TCM-220: Finalizing Seminars

**Abschlussbegleitende Seminare**

<table>
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<tr>
<th>Language</th>
<th>English</th>
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<tbody>
<tr>
<td>Responsible</td>
<td>Prof. Dr. Boris Mahltig</td>
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#### Workload

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<tr>
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#### Lectures

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</table>

| Name: Prof. Dr. Mahltig, Boris   | HPW | CP | L | SL | Ex | P | Sem. |
| Teacher: Prof. Dr. Mahltig, Boris|     |    |   |    |    |   |      |

#### Examinations

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<td>TCM-222</td>
<td>Seminar Final Thesis</td>
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</table>

#### Remarks
General Aims of Module

The students place their final topic of the bachelor thesis in a scientific environment. A methodic and suitable workplan and timetable for realizing the thesis is presented and discussed. They present the used or proposed research methods and intermediate results in a (self-)critical reflection. The own work and the results of the other participants together give an up-to-date overview of the specific subject. The supervisors participate at the presentations and discussions.

Workshop Scientific Methods

Content

Offered contents may vary from year to year. Some courses will be realized and offered as eLearning courses.

The following topics are fixed:
- Evaluation of numerical data and statistical test results by using SPSS and Excel
- Deepened recherché in databases and for patents
- Presentation skills and rhetoric
- Writing scientific papers, especially the final thesis, using MS Office

Literature

Dependent on topic

general helpful for writing training are:
V. Ahrens, Abschlussarbeiten richtig gliedern, 2014, vdf Hochschulverlag Zürich
E. Müller, Schreiben in Naturwissenschaften und Medizin, 2013, UTB
J. T. Yang, Scientific Writing, 1995, World Scientific, Singapore
R. Bradbury, Zen in the Art of Writing, HarperCollins UK
Seminar Final Thesis

Content

Students, who got a reservation of a special topic for their final bachelor thesis, come together in subject-specific groups of about 6 students.

Presentation of the status regarding the work on the thesis, the current scientific base, the used and proposed methods and probably first results
- Working paper about this status
- Guidance through a subject-specific discussion about the presentation
- Participation at all other group meetings

Literature

dependent on the topic of the bachelor thesis

helpful for writing thesis:
V. Ahrens, Abschlussarbeiten richtig gliedern, 2014, vdf Hochschulverlag Zürich
E. Müller, Schreiben in Naturwissenschaften und Medizin, 2013, UTB
J. T. Yang, Scientific Writing, 1995, World Scientific, Singapore
R. Bradbury, Zen in the Art of Writing, HarperCollins UK
**Module**  
TCM-390: Internship Semester or Semester Abroad  
*Praxis- oder Auslandsstudiensemester*

**Language**  
English

**Responsible**  
- alle Lehrende des Fachbereichs

**Workload**  
- **HpW** 30 CP 30
- 450h presence
- 200h preparation and follow-up work (exercises, literature, tutorials)
- 100h preparation for examination

### Lectures

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<th>Name: Internship Semester or Semester Abroad</th>
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**Precondition:**  
a minimum of 89 CP

### Examinations

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<th>Type</th>
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<tr>
<td>TCM-390</td>
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<td>T</td>
<td>Certificate</td>
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</table>

### Remarks
General Aims of Module

The internship semester gives students insight in their future work by joining an internship in a company in the textile and clothing industry. The employability is improved by practicing the knowledge and skills learned in the study courses in an industrial environment. After the end of the internship the students have to handout a written report to the university’s supervisor. It includes a description of the work done in the internship as well as a personal resume.

As an alternative to the internship the students may do a semester abroad at a foreign university. This will improve significantly their language skills, intercultural competences as well as specific knowledge. Students have to pass at least a volume of 20 Credit Points at the foreign university. In addition they have to handout a written report to the university’s supervisor. It includes a description of the joined courses as well as a personal resume.

Internship Semester or Semester Abroad

Content

the specific contend is defined by the individually selected internship or semester abroad.

In general the internship semester gives students insight in their future work by joining an internship in a company in the textile and clothing industry. The employability is improved by practicing the knowledge and skills learned in the study courses in an industrial environment. After the end of the internship the students have to handout a written report to the university’s supervisor. It includes a description of the work done in the internship as well as a personal resume.

As an alternative to the internship the students may do a semester abroad at a foreign university. This will improve significantly their language skills, intercultural competences as well as specific knowledge. Students have to pass at least a volume of 20 Credit Points at the foreign university. In addition they have to handout a written report to the university’s supervisor. It includes a description of the joined courses as well as a personal resume.

Literature

according to the individual internship or semester abroad
Module: TCM-230: Marketing

Language: English

Responsible: Prof. Dr. Susanne Müller

Workload:
- HpW: 4
- CP: 5
- 60h presence
- 43h preparation and follow-up work (exercises, literature, tutorials)
- 22h preparation for examination

Lectures

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<th>Name</th>
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<th>CP</th>
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Examinations

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<tbody>
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<td>TCM-230</td>
<td>Marketing</td>
<td>Pr</td>
<td>written exam</td>
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</tbody>
</table>

Remarks

In der 4 stündigen Veranstaltung "Marketing" werden zunächst diese neuen Marktherausforderungen in diversen Case Studies erarbeitet, um daraus dann die richtigen Konzepte für zukünftigen Marketingstrategien zu entwickeln. Dabei werden neben den klassischen, traditionellen Marketinginstrumenten auch Schwerpunkte gelegt auf die neuen Möglichkeiten, die sich durch die Nutzung von Social Media Marketing für die Fashion-Unternehmen ergeben. Hierzu wird ebenfalls auf Basis diverser Case Studies Problemansätze und Lösungsmöglichkeiten erarbeitet.

Tremendous changes with enormous economical and social challenges describe the 21st century. The result are big global market potentials for the fashion industry. Depending on the desires of the fashion consumers, today’s fashion products have to be offered fast. This makes it possible that the fashion companies in the age of fast fashion are able to compete. Besides the domestic markets there have to be found and conquered global markets to compensate the satisfied domestic consumers.

In the 4 hours weekly lecture "Marketing" these new market challenges are described in several case studies. On their basis, new marketing concepts will be developed with the help of the traditional marketing tools as well as with the Social Media Marketing tools. With the help of additional case studies, solutions will be found.

Marketing:
- Marketing Umgebung,
- Globale Märkte,
- Marktsegmentierung und Positionierung,
- Customer relationship management,
- Wettbewerbsvorteile,
- Markenpolitik und Verpackung,
- Produktentwicklung,
- Produktlebenszyklus-Analysen,
- Kontrahierungspolitik,
- Distributionspolitik.

- Marketing environment and global marketplace,
- Market segmentation, targeting and positioning,
- Building customer relationships,
- Creating competitive advantages,
- Brands, products, packaging,
- Product development and life-cycle-strategies,
- Pricing considerations and approaches,
- Pricing strategies.
Marketing

Content

- Marketing Umgebung
- Globale Märkte
- Marktsegmentierung und Positionierung
- Customer relationship management
- Wettbewerbsvorteile
- Markenpolitik und Verpackung
- Produktentwicklung
- Produktlebenszyklus-Analysen
- Kontrahierungs politik
- Distributionspolit
- Social Media Marketing

- Marketing environment and global marketplace
- Market segmentation, targeting and positioning
- Building customer relationships
- Creating competitive advantages
- Brands, products, packaging
- Product development and life-cycle-strategies
- Pricing considerations and approaches
- Pricing strategies
- Social Media Marketing

Literature

Kotler, Philip: Principles of Marketing.
Module: TCM-240: Printing  
*Digitaldruck*

**Language:** English  
**Responsible:** Prof. Dr. Mathias Muth  
**Workload:**
- HpW 4 CP 5  
  60h presence  
  43h preparation and follow-up work (exercises, literature, tutorials)  
  22h preparation for examination

### Lectures

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**Teacher:** Prof. Dr. Muth, Mathias

**Precondition:**

### Examinations

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### Remarks
General Aims of Module

The students know the basic technologies of textile printing. They are able to compare the different printing processes and they are competent to select adequate printing systems, dyestuffs, auxiliaries textile substrates for different applications.

The knowledge of selecting the appropriate procedures for the most important fibres such as cotton, viscose, wool as natural fibres and polyamide, polyester, polyacrylics and elastic fibres will be taught.

By learning quality assessment procedures the students will be able to identify possibilities and limitations of textile printing technologies.

Digital Printing

Content

- Basics of Digital Textile Printing
- Definitions
- History
- Market data
- Trends and perspectives
- General principles and requirements on textile substrates
- Pretreatment
- Coating
- Fixation
- Aftertreatment
- Inks for digital textile printing
- Requirements on water-based inks
- Dye-based vs. pigment inks
- InkJet Technology
- Drop-On-Demand vs. Continuous InkJet
- Print heads
  - Piezo
  - Bubble Jet
  - Valve Jet
- Basics in Colour Management Software
- RIP
- Subtractive colouration
- Advantages vs. disadvantages of digital textile printing
- Ecological aspects of digital textile printing

Literature

Digital Textile, different issues, World Textile Information Network
**Module**
TCM-250: Supply Chain Management
*Lieferkettenmanagement*

**Language**
English

**Responsible**
Prof. Dr. Markus Muschkiet

**Workload**

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**Remarks**
General Aims of Module

Students are able to evaluate different Supply Chain Management (SCM) strategies and approaches. They should also be able to succeed in SCM projects with interdisciplinary teams in their professional life.

Logistics

Content

In the lecture Logistics the basics of the different logistics areas are taught. In the first part the focus will be on intralogistics with its material flow and storage techniques. In particular, systems of textile and clothing logistics, such as conveyor systems for hanging goods and (automated) storage systems. In the second part the transport and traffic logistics are considered. Those parts cover the basic transportation, transshipment and warehouse processes of logistics. In addition, the interfaces between these processes and applied methods are taken up and illustrated by examples. The aim is to communicate the general logistical foundations in combination with a deepening aspect of the textile and clothing industry / logistics.

Literature

Muschkiet, M.: Logistics, script of lecture
Fashion Retailing

Content

- Fashion Retailing Today - Facts and Figures
- Formats in Retailing - How to Structure Fashion Retailing
- New Forms of Fashion Retailing: Offline, Online, No-Line
- Online Fashion Retailing: Specifics, Demands, Best Practices
- Format Positioning in Fashion Retailing
- Verticalisation in Fashion Retailing
- Internationalisation in Fashion Retailing
- Buying and Inventory Management
- Marketing and Sales in Fashion Retailing
- Category Management in Fashion Retailing - Demand Side
- Logistics and Supply Chain Management in Fashion Retailing - Supply Side
- Logistics and Physical Distribution
- E-Procurement and Automation

Literature

Saviolo, Stefania, Testa, Salvo, Strategic Management in the Fashion Companies, Etas, Milano 2002
**TCM-260: Human Resources Management**

*Personal management*

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### Remarks
General Aims of Module

Companies are successful if their employees are successful. The selection, qualification, and development of the staff are main targets to ensure the economy of companies and the human design of industrial work.

Students get an overview about important aspects of human resources, that lead to highly motivated and qualified employees and therefore to successful companies. They know about instruments, concepts and proceedings to find out about potential weak spots in organizational behaviour as well as to improve situations. This enables them to develop and introduce future-orientated solutions in industry.

Human Resources Management

Content

- Overview about the different fields of Human Resources
- Leadership styles and necessary leadership competencies
- Motivational theories and their transfer in real leadership systems
- Negotiations
- Personnel Time Management
- Job applications and job interviews
- Quantitative and qualitative personnel planning
- Intercultural aspects in Human Resources
- Continuous Improvement Process (CIP)
- Basic forms of classic and "modern" remuneration systems
- Assessment Centres
- Generation Y

Literature

Harsch, W.: Manuscript, version of the relevant semester.
Module: TCM-270: Ergonomics
Arbeitswissenschaft

Language: English
Responsible: Prof. Dr. Walter Harsch

Workload:
- HpW 4 CP 5
- 60h presence
- 43h preparation and follow-up work (exercises, literature, tutorials)
- 22h preparation for examination

Lectures

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Teacher: Prof. Dr. Harsch, Walter

Precondition: None

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Remarks
General Aims of Module

The design and continuous optimization of the work processes are main targets to ensure the economy of companies and the human design of industrial work.

Students therefore know essential elements how to organize work and design it in detail. They are able to analyze and optimize work systems and to assess consequences of unfavorable and improved work processes. Such knowledge about the correct use of manpower enables the students to support the future viability of companies.

Ergonomics

Content

- Objectives and contents of ergonomics
- Evaluation levels of work processes
- Physiological and anthropometric aspects of work design
- Calculation of maximum permitted workloads
- Design of work methods according to the rules of motion economy, motion simplification and motion intensification
- Time data methods
- Methods Time Measurement (MTM)
- Groups
- Motivational theories
- Basic forms of work structuring
- Context between legal, tariff and in-house regulations of work
- Working time, breaks, flex time, shift work
- Environmental conditions (e.g. illumination, noise)
- Evaluation of work systems

Literature

Harsch, W.: Manuscript, version of the relevant semester.
TCM-280: Organisation and Controlling

Organisation und Controlling

Language: English

Responsible: Prof. Dr. Gerrit Heinemann

Workload:
-HpW 4 CP 5
-60h presence
-43h preparation and follow-up work (exercises, literature, tutorials)
-22h preparation for examination

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General Aims of Module

Organisation and Controlling are main success factors in management. Especially for textile- and fashion enterprises, which are leading examples for other industries due to all restructuring topics, they are key issue. The structural change of the last decades could have only be managed on the basis of adequate organisational tools. It’s all about structural change management and also optimisation of processes. This is the reason, why pure verticals like H&M and also inditex are so successful. They are the most successful fashion companies in the world and example for other industries. Students have to understand the opportunity of organisational reinventions. They need basic knowledge of business- and process organization. They also should be able to control changes and companies. That’s why controlling and modern controlling methods have also a key role in modern management. The students should know the tasks of Controlling as Top-Management function.

After their study students are able to differentiate the functional and institutional aspects of Corporate Controlling. They know the tasks of Strategic Controlling, can explain the instruments of Strategic Controlling (g.e. Gap-, Portfolio- and LC-Analysis) and are able to use them in exercises. Students know the tasks of Operative Controlling, can explain the instruments of operative Controlling (g.e. ratios, margin- and effectivity-measurement) and are able to use them in exercises. They know the most important KPI’s like ROCE and understand the interdependencies of the main key figures.

The students are also able to categorize principle terms of Business Organisation. They understand first terms of Organizational Sciences, show understanding for Business Processes, achieve a broad view about the relevant issues of Organizational Sciences, know the relevant terms of Organizational Sciences and know the differences between Structural Organisation and Process Organization. They also can describe the relevant forms of Primary Organization and Secondary Organization, know the advantages of different forms of structural Organisation and can repeat the main areas of working organisation. The student also know the basics and objectives of process organisation. They understand the difference and relationship of structural and process organisation. The students get an overview of central applications of process organisation and know the main specifics of process organisation in manufacturing. They understand, which methods are used in process organisation. They can describe the basics and characteristics of process organisation, understand the development and optimisation of business processes and their external linkages. The students are able to differentiate the traditional value chain and the virtual value chain.
## Organisation

### Content

**BUSINESS ORGANISATION**

- Purpose and Motives of Organisation
- Objectives of Organisation and Companies for Organisation
- Interrelation between Business and Process-Organisation
- Job Development and Job Filling
- Structural Principles and Hierarchies
- Forms of Primary Organisation in Business Organisation + Case Study
- Forms of Secondary Organisation in Business Organisation + Case Study
- Delegation and Leadership + Case Study
- Structure follows strategy

**PROCESS ORGANISATION IN MANUFACTURING**

- Value Chain Concept - 90°-Shift of the Organisation
- Objectives of Process Organisation
- Areas of Manufacturing-Organisation
- Workshop-Manufacturing versus Assembly-Line-Manufacturing
- PPS-Production-Planning-Systems
- Manufacturing 4.0 - FMC-Flexible-Manufacturing and CIM-Computer Integrated Manufacturing
- Team-Organisation in Manufacturing
- Total-Quality-Management
- Material-Management and Inhouse Logistics

### Literature


Dankbaar, Ben (Hrsg.), Perspectives in industrial organizations, Kluwer Acad. Publ., last edition

Robbins, Stephen P., Organization theory : structure, design, and applications., last edition
Controlling

Content

Definition of Controlling
- functions/tasks of controlling
- controlling within the organisation
- selfunderstanding of controlling
- perspectives of controlling

Information supply in controlling
- information supply by financial accounting
- information supply by cost accounting
- information supply by management reporting
- key performance indicators

Strategic Controlling
- the strategic management process
  - vision-/mission-definition
  - setting objectives
  - crafting and formulation of the strategy
  - implementing and evaluating of the strategy
- instruments and methods of strategic controlling
  - szenario analysis
  - lifecycle analysis
  - portfolio analysis
  - swot-analysis
  - competitive advantage analysis
  - gap analysis

Operational Controlling
- profit planning
- the profit wheel
- the cash wheel
- the roe wheel

Functional Controlling
- supply chain controlling
- production controlling
- marketing controlling
- sales & services controlling

Literature

Bangs, David: Controlling Cash Flow, Boston 1989
Weber Jürgen/Schäffer, Utz: Introduction to Controlling, Stuttgart 2008
Module  
TCM-290: Production Engineering  
*Bekleidungsentwicklung*

Language  
English

Responsible  
Prof. Mathias Paas

Workload  
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Remarks
General Aims of Module

Students get confronted with relevant manufacturing steps in processing sewn or welded products like garments, seats or technical textiles etc..
Starting from the definition of requirements for all kind of trimmings and fabrics to spreading and cutting, followed by fusing-, joining-, shaping- and finishing techniques will get introduced and discussed.

Students should be able to choose the optimum techniques in processing according to the needs of a product or article.
They get enabled to evaluate various manufacturing techniques according to the size of production sites as well as to technology level of probable production countries.
Based on standard products like Jeans or T-shirts different options in manufacturing get introduced and students can evaluate and choose best techniques as well as machinery as well as working methods.
Principles in organizing productions flow are taken to demonstrate e.g. single or bundle production.
Übergreifende Modulziele / Learning Outcomes


Students will get comprehensive theoretical and practical knowledge in use and application of clothing machinery and with manufacturing of clothing textiles, home textiles and technical textiles which is an essential field of activity of executive staff in the clothing industry.

The students learn to understand and apply processes and machinery in the clothing industry. The functions and structures of the machinery and their application in manufacturing of textile products will be studied in practical training. This knowledge and experiences allows students to plan efficient machine and process technological applications. This will be practical trained with manufacture of different products (jeans, shirts).

Modulinhalte / Contents

Bekleidungsmaschinen (Clothing Production Machinery)

- Einführung: Bedeutung der Bekleidungs- und Bekleidungs-maschinenindustrie
- Maschinenelemente
- Legeverfahren und -maschinen
- Schneideverfahren und -maschinen
- Einrichtung
- Nähmaschinen: Klassifikation, Standardnähmaschinen, Nähautomaten, Nähanlagen, Zubehör
- Schweissverfahren und -maschinen
- Fixierverfahren und -maschinen
- Bügel- und Finishverfahren und -maschinen
- Forschung und Entwicklung

- Introduction: means of the clothing industry, machinery in clothing manufacturing
- Clothing machinery elements
- Spreading methods and machinery
- Cutting methods and machinery
- Preparation of cut work for sewing
- Sewing machinery: classification, basic sewing machinery types, simple automatics, automated workstations, associated work aids
- Welding methods and machinery
- Fusing methods and machinery
- Pressing and related garment finishing: methods and machinery
- Research and development
Fertigungsverfahren (Clothing Production Engineering):

- Einführung: Bedeutung der Bekleidungsindustrie und anderer konfektionierender Sparten
- Materialhandhabung und Legeverfahren
- Schneide- und Trennverfahren
- Einrichtung für die Näherei
- Fügetechnologien spez. der Näherei, Nahtarten, Stichtypen, Handling und Automationsansätze, Hilfsmittel und Arbeitsplatzgestaltung
- Schweiß- und Klebeverfahren
- Fixier- und Laminierverfahren
- Bügel- und Finishverfahren
- Praktische Erprobung bei der Fertigung eines Herrenhemdes
- Forschung und Entwicklung

- Introduction: means of the clothing industry, technical sewn products etc.
- Fabric handling and spreading methods
- Cutting-, welding and other separating methods
- Preparation of cut work for sewing
- Joining technologies esp. sewing, seamtypes, basic stitch types, material-handling and automation workstations, associated work aids
- Welding and glueing methods
- Fusing and laminating methods
- Pressing and related garment finishing: methods
- Manufacturing of a man´s shirt in practice
- Research and development

Literature

Clothing technology, Europa Lehrmittel Verlag
Module | TCM-300: Advanced Product Engineering  
| Rationelle Produktionsverfahren
Language | English
Responsible | Prof. Mathias Paas
Workload |  
| HpW | 4  
| CP | 5
| 60h  | presence  
| 43h  | preparation and follow-up work (exercises, literature, tutorials)  
| 22h  | preparation for examination

### Lectures

| Name: | Advanced Product Engineering |  
| Teacher: | Prof. Paas, Mathias |  
| Precondition: | Clothing production engineering |  

### Examinations

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Remarks
General Aims of Module

Students get confronted with relevant manufacturing steps in processing sewn or welded products like garments, seats or technical textiles etc.

Starting from the definition of requirements of operations in the sewing industry based on work science related checklists students will get enabled to choose the right operator to a relevant operation. Workplace layout as well as working methods are discussed and improved.

Basics in Work science systems like REFA and MTM are given and students should know the instruments to control production efficiency as well as product quality.

Students should be able to choose the optimum techniques in processing according to the needs of a product or article to achieve productivity as well as product quality.
Advanced Product Engineering

Content

Learning Outcomes

Students therefore learn:
- an overview about the departments of product development today.
- the history and the future for this departments.
- the different kind of working in these departments.
- product development in foreign countries.

In an exemplary fashion is to work from idea until the production

CAD 2D/3D Bekleidungskonstruktion (CAD 2D/3D Clothing Construction):
- 3D Modelltheorie
- Zusammenhänge zwischen 2D- und 3D- Bekleidungskonstruktion
- Menschmodelle
- 3D- Simulation von Bekleidung
- 3D- Präsentation von Bekleidung

- 3D- model theorie
- Relations between 2D and 3D design
- Avatars
- 3D simulation of clothing
- 3D presentation of clothing

Produktentwicklung und Prozessdesign (Produkt Development Process Design):
- Definition Prozessdesign
- Abteilungen: Design
  - Modellmacher
  - Gradierung
  - Lagenleger
  - Arbeitsvorbereitung
  - Passive Lohnveredlung
  - Vollkauf
  - Projektmanagement
  - Produktabnahme

- Definition process design
- Departments of:
  - Design
  - Patternmaking
  - Grading
  - Lay planning
  - Work process preparing
  - Cut make and finishing
  - Fullbuy (whole sales)
  - Check the product

Advanced Product Engineering:
Students get introduced in the product development processes. The involvement of Operators, Machinery, Method of manufacturing as well as Quality requirements are demonstrated. Techniques to determine
optimal product engineering will be shown.

- Overview in manufacturing techniques
- Systematical comparison of manufacturing techniques based on Jeans-production reflecting other related products
- Work and time studies
- Cost calculation of sewn products from fabric costs to final sales price at POS
- Checklists for improvement of Workplaces in sewing industries as well as sewing methods
- Operators testing, Standard test: skills and abilities
- Operators training programs
- Define Quality aspects of sewn products and start Quality descriptions later used in Quality manuals
- Practical exercises

Literature

Eignungstest für Näherinnen, BTI e.V. Mönchengladbach
Lehrunterlage für Ausbilder von Näherinnen
Clothing technology, Europa Lehrmittel Verlag
TCM-310: Clothing Production

Bekleidungsfertigung

Language: English
Responsible: Prof. Dr. Kerstin Zöll
Workload:

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General Aims of Module

The students will get comprehensive theoretical and practical knowledge in use and application of clothing machinery and with manufacturing of clothing textiles, home textiles and technical textiles which is an essential field of activity of executive staff in the clothing industry. The students learn to understand and apply processes and machinery in the clothing industry. The functions and structures of the machinery and their application in manufacturing of textile products will be studied in practical training. This knowledge and experiences allows students to plan efficient machine and process technological applications. This will be practical trained with manufacture of different products (e.g. shirts, trousers).

Clothing Production Machinery

Content

Clothing Production Machinery

- Introduction: Clothing manufacturing / clothing engineering: facts and figures
- Spreading technology and machinery
- Traditional and automatic cutting machinery
- Sewing machinery: classification, sewing machines for the different stitch types, sewing tools, stitch formation process, feeding systems, automation, quality recommendations
- Alternative joining technologies
- Research and development

Literature

A detailed script is offered.

Tyler/Carr & Latham’s: Technology of Clothing Manufacture, Blackwell Science, 2000
Amann Group: Focus Sewing and Embroidering threads I and II

Due to the nature of the content reading is done with free available sources in the internet.
Clothing Production Practical Training

Content

Fertigungsverfahren Praxis (Clothing Production, Practical Training)

Sicherheitsunterweisung für Arbeiten in den Konfektionstechnischen Laboren, Bedienungsunterweisung an produktionsnotwendigen Maschinen und Anlagen.
Im Zuge der praktischen Übungen wird am Beispiel eines Basisproduktes (Jeans, Hemd) der Maschinen- und Verfahrenseinsatz praktisch erprobt und angewendet.

General Safety-instruction for the use of laboratory’s machinery, General instruction in handling of machinery and equipment necessary to mak up a shirt.
Students will receive practical training in manufacturing laboratories. Lay-planning exercises, Cutting and laminating practical training as well as sewing and ironing exercises while doing an own shirt. Exercises will get introduced be video film sequences.

Literature

Shirt making operations on Youtube
Shirtmaking video published by Dürkopp-Adler Comp., Bielefeld
Shirtmaking operations on video by Hochschule Niederrhein (not open for public use)
### Module

**TCM-320: Clothing Construction**

_Bekleidungskonstruktion_

**Language:** English  
**Responsible:** Prof. Dr. Michael Ernst  
**Workload:**  
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### Lectures

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**Precondition:**

- **Name:** Product Development Process Design  
- **Teacher:** Prof. Dr. Ernst, Michael  
- **Precondition:**

### Examinations

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### Remarks
General Aims of Module

Students get a deep understanding of product development in clothing industry, starting with a design idea and ending up with a finished product presented at POS. They learn about all the basic tools used in industry to handle this process along the product development chain. A main focus is on digital pattern making resulting in getting fundamental knowledge in this field with regard to future concepts in simulation technology. This comes together with gaining manufacturing skills to build up expertise and to be skilled in analysing existing and developing new process ideas for clothing industry.

CAD 2D/3D Clothing Construction

Content

- Basics of 2D-3D prototyping
- Overview 2D-3D CAD software, virtual stitching, flattening
- Introduction to a selected 2D program
- Introduction to a selected 3D program
- Building up basic blocks, styles and models
- Virtual fit control of basic blocks
- Virtual Prototyping- stylistic and technical
- Virtual product development 2D-3D-2D
- Generation of scanatars and import of scanatars
- Rendering methods for product presentation

Literature

Product Development Process Design

Content

- Definition of product development
- Diversity of process types for product development with outsourced process steps
- Process dependant tasks of design and pattern departments, stylistic and technical product development, work process planning
- Implementation of agencies and suppliers overseas
- Quality consistency in product development process
- Manufacturing and quality check of products
- Real versus virtual product development
- Virtual prototyping and product development based on avatars, scanatars and statistical avatars
- Importance of sizing systems, sizing and fit, international sizing, body measurement charts and ready measurement charts, grading tables
- Examples of product development based on requirement profiles: women`s outer garment, outdoor, workwear, protection suits

Literature

Module: TCM-330: Product Planning  

*Produktplanung*

Language: English

Responsible: Prof. Ute Detering-Koll

Workload:

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Remarks: 4 5

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General Aims of Module

In times of global markets and production the modul Product Planning gives a branch-neutral overview of theoretical basics for Product Data Management (PDM) and Production Planning and Control (PPC). Thus the students understand PDM as an integrated, structured and consistent administration of all data and documents which have to be generated, processed and passed on during the development of new or modification of existing products. In addition to that the students become acquainted with the dynamic view and integration of enhanced applications. Besides that, they are able to understand the prerequisites and procedures of enterprise implementation of PDM-Systems. In addition, the methodological and organizational measures as well as models of the PPC are discussed. These aspects will be combined with fundamental factors and trends affecting production companies and their production. The aim is to provide the basis for assessing PPC. Furthermore the processes upstream and downstream of the production process have an appropriate view in order to be able to classify the interfaces and influencing variables to production in general and PPC in particular.
Product Data Management

Content

Introduction
- Current position vis-à-vis competitors
- New work techniques and structures
- Common initial position
- Definitions
- Historical development
- Product life cycle
- Value chain

Static Models - Product Models
- Data management
- Document management
- ERP couplings

Dynamic Models - Process Models
- Process Management (Workflow Management)
- Configuration Management (Lifecycle Management)

Comprehensive Models - Integration Models
- Engineering Warehouse (EW)
- Enterprise Application Integration (EAI)
- engineering Collaboration (eCol)
- Supply Chain Management (SCM)
- e-Commerce (eCom)

Literature

Within the lecture "Production Planning and Control" (PPC) methodological and organizational measures as well as models of the PPC are discussed. These aspects will be combined with fundamental factors and trends affecting production companies and their production. The aim is to provide the basis for assessing PPC. In addition, the processes upstream and downstream of the production process have an appropriate view in order to be able to classify the interfaces and influencing variables to production in general and PPC in particular.

The following topics are discussed:
- Product development
- Basics of PPS models with push and pull production
- Production program planning
- Forecasting
- MRP
- Lot size optimization and warehouse management
- Scheduling and capacity planning
- Production control
- The basics of supply chain management concepts

Muschkiet, M.: Production Planning and Control, script of lecture
<table>
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| Examinations | | | | |
| --- | --- | --- | --- | |
| Code No. | Name | Type | Examination | |
| TCM-340 | Technical Textiles | Pr | written exam |
General Aims of Module

Upon successful completion of the course students have a thorough and extensive expertise in developing and manufacturing technical textiles.
They overlook the materials and application fields of technical textiles.
For selected materials, students can analyze application scenarios and identify required properties of textile materials, and thus develop a specification list of technical textile products.

Manufacturing and Application of Technical Textiles 1

Content

- Technical fibre and yarn production
  - Production
  - Characteristics
  - Application fields
- Production of knitted, woven and braided structures and nonwovens for technical applications
  - Technologies
  - Textile properties
  - Application areas
- Finishing of technical textiles
- Pattern making and confectioning of technical textiles
  - Sewing
  - Glueing
  - Welding
- Final products and their application scenarios

Literature

Gulrajani: Advances in the Dyeing and Finishing of Technical Textiles
Manufacturing and Application of Technical Textiles 2

Content

Car Technology
- Airbags
- Seat belts
- Tires
- Car interior
  - Seat covers
  - Head liner and door casings
  - Mouldings
    - Historical development
    - Fibers and processes in production
    - Components
    - Requirements and test methods

Architectural Textiles
- Historical development
- Fibers, fabrics, coatings
- Membrane components
- Architectural structures
- Properties
- Assembly

Geotextiles
- Historical development
- Definition of membranes
- Membrane functions
  - Mechanical
  - Hydraulical
- Membrane duties
  - Separation
  - Filtration
  - Drainage
  - Reinforcement
  - Erosion control
  - Sealing
  - Protection

Literature

Gulrajani: Advances in the Dyeing and Finishing of Technical Textiles
**Module**  
TCM-350: Fabric Production  
*Gewebeherstellung*

**Language**  
English

**Responsible**  
Prof. Dr. Alexander Büsgen

**Workload**  

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**Remarks**
General Aims of Module

Fabric Production is guiding students into detailed steps and processes for manufacturing of broad, narrow woven and braided products.

Students have well-grounded knowledge about all steps to manufacture a woven and braided fabrics. They are able to list and to explain all preparation processes, as well as all weaving and braiding machine functions like weft insertion, shedding, take-up. They can balance the advantages and disadvantages of all different process steps and they know the use of these methods in regard to used yarn material requirements and resulting quality of fabrics. Students are able to calculate and design woven and braided fabrics, in particular to calculate fabric areal resp. linear weight, cover factor and time of production.

Weaving Processes

Content

1. Introduction, History
2. Winding
3. Twisting
4. Warping, Sectional Warping
5. Sizing
6. Drawing-in, Set-up
7. Shuttle Weft Insertion
8. Projectile Weft Insertion
9. Rapier Weft Insertion
10. Air-jet Weft Insertion
11. Shedding
12. Warp Let-off, Taking-up
13. Temples
14. Selvages

Calculation:
Fabric areal weight, yarn material requirement, time of production, weave coefficient/tightness Factor, cover factor

Literature

Mohammed, Mansour: Weaving: Conversion of Yarns to Fabric, Merrow Verlag, 1982
Narrow Fabrics

Content

Introduction
- History of narrow fabrics
- Products, properties and applications of narrow fabrics

Narrow weaving:
- Machines for narrow weaving - shuttle and needle weaving
- Weaving systems (selvages)
- Special pattern of narrow weaving ("Rüschen", "Köperband", "falscher Atlas", pattern for selvages, hollow and half hollow selvages, elastic tapes)
- Multilayer tapes
- Weaving with two or more needles or shuttles , shedding (Low-Middle-High), control sequence

Braiding:
- Machines for braiding, track, take off
- Carrier construction
- Tubular, flat and form braiding
- Pattern in the braiding and relation between carrier occupation and braiding pattern
- Calculations for braiding

Pillow laces and rope production

Literature

Kyosev, Y., Skript Schmaltextilien
Kyosev, Y., Braiding technology for textiles, Woodhead Publishing, 2014
Essig, E., Nadel-Bandwebtechnik, Jakob Müller Institute of Narrow Fabrics, 2005
Melliand Band- und Flechtindustrie / Euroseil Deutsche Seilerzeitung, Fachzeitschrift, Erscheinungsweise: vierteljährlich
Verlag Melliand Textilberichte, Deutscher Fachverlag GmbH
Atkins and Pearce Handbook of Industrial Braiding, F. Ko, C. Pastore, and A. Head, Atkins and Pearce, Covington KY, October, 1989
H A McKenna, J W S Hearle, N O’Hear, Handbook of fibre rope technology, Woodhead Publishing Limited
Module: TCM-360: Textile Products

Textile Produkte

Language: English

Responsible: Prof. Andrea Rieschel

Workload:

- Presence: 60h
- Preparation and follow-up work (exercises, literature, tutorials): 43h
- Preparation for examination: 22h

Lectures

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Remarks
General Aims of Module

The lecture "Textile Products" deals with knowledges of fabrics for clothing and home textiles. The participants are able to recognize and analyse high class fabrics for clothing, recognize characteristics and risks of quality and assign them to their application. Analysis and assessment is practiced on basis of examples. Further technical construction and calculation of woven fabrics build a main part. The participants are enabled to produce a woven fabric according to specific requirements and to calculate all necessary production data like weavenotation, fabric balance, cover factor, weavingmachine arrangements, material calculation, and calculation of fabric area weight. Further the students work with the technology of multilayer and pile fabrics, carpet production and their typical qualities. The students are able to realize own construction principals. Analysis and assessment is practiced on basis of examples. A main part builds the special production process and machines of pile fabrics and carpets.

Home Textiles

Content

In the lecture "Home Textiles" the students learn knowledge for special types of fabrics used in the sector of home textiles.

- Process of carpet production
- Wilton/ Brüssel, Aixminster
- Tufting
- Production upolstery and decoration fabrics
- Double layer
- "Scherli" fabrics
- Pile fabrics
- Cloquet fabrics
- Terry fabrics

Literature

Prof. Dipl-Ing. A. Rieschel: Script of lecture, Hochschule Niederrhein, Mönchengladbach 2015
Wilhelm Artz, Heimtextilien, Schiele & Schön Verlag, Berlin, 1970
Suzanne Trocmé, Stoffe, Haupt Verlag, Bern, 2003
Martin Kienbaum, Bindungstechnik der Gewebe II und III, Schiele & Schön Verlag, 1996
Fischer/ Gürke-Lang/ Textile Bodenbeläge, F.C. Müller Verlag, Heidelberg, 2000
Advanced Textile Products

Content

Fundamentals in construction and quality of fabrics for clothing:
- weave notation
- warp-/weft count
- yarns, material
- fabric balance
- fabric analysis

Characteristics of fabrics
- construction
- material and blends
- comfort in wear, care properties
- Application of fabrics
- Calculation of fabric area weight
- Properties of woven fabrics
- Quality assessment
- Calculation of fabric construction and cover factor

Literature

Prof. Dipl-Ing. A. Rieschel: Script of lecture, Hochschule Niederrhein, Mönchengladbach 2015
Robinson A.T.C., Marks R., Woven Cloth Construction, The Textile Institute, 1967
### TCM-370: Design Theory

*Designtheorie*

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### Remarks
General Aims of Module

Borrowing the term from the English language the German Bauhaus formed our modern understanding of design. In the narrow and traditional sense of the word, design refers to an artistic form of industrial products and commodities which are designed appropriately to their material and use. Furthermore and in a more general sense, the term design refers to a concept designed to improve everyday life and industrial life. The latest definitions of designs are multifarious and are partly still developing. The word design is also being used in different new context, like for example of software-, skin-, and web design as well as since the 1980s for design management. In this context, design refers most often to the development of a project and its quality management. Hence, the students of Textile- and Clothing Management will encounter at least different areas of design during their studies which are dedicated to textile and fashion design in the traditional and professional sense of the word. This involves the knowledge of history, theory and the developing of design concepts. The students will be able to understand the basic laws of visual perception and design and assess their professional applications.

The students know design dimensions and are able to differentiate design in its various dimensions: historical, aesthetic, psychological, product specific, process-oriented etc. They have basic knowledge in the area of design processes and design methods and they are able to communicate respecting design contents in its correct technical language.

The seminar design theory and colour theory stands in relationship. The students should know and to be able to analyse the determining factors of the colours in order to categorise them into different colour systems and to develop applicable criteria of colour evaluation which is important to read the symbolic meaning of design products. Beginning with the conditions within the laws of physics, light and colour and with different systems of mixing colour will be introduced. The perception of colour will be explained within the following categories: as the biological, physiological process of seeing and as the psychological process of perception. Subjective and objectifying perception will be discussed as a part of the phenomenology of perception as well as a part of cultural historical condition. Examples of colour design in the applied and fine arts will be examined and discussed.

The last phase of the lectures debates the cultural and historical conditions and forms of aesthetic perception. The lecture will be completed with practical work according to the theory of colour by Johannes Itten, which gives the students the possibility to analyse, to categorise and to evaluate determining factors in design applications. The students will use the knowledge of Gestalt parameters to communicate fashion - from point of view of creating info graphics until using graphical design elements and -laws of perception for exercise of transfer: to support marketing and promotion campaigns in the textile and clothing industries. Furthermore a design theoretical based consciousness for sustainable design products will be set the basics for on going seminars in higher semesters like fashion theory and multidimensional design as well for the master program.
Design Theory

Content

- Introduction: What is Design?, What is good design? What is green design? -
- What about green washing? and the responsibility of designer and design manager?
- Design history and the benefit for innovative design for the future, Design Trends as determining factor - design strategies and unique selling points.
- Perception and effects of CI and CD in three-dimensional ways, CF and functions of CF
- Design Driven Innovation and other methods of design
- Design Management in Design - especially Textiles Design
- Theory of Design versus Sciences of Design
- Scientific working in design, research and documentation in design
- New materials, new methods, transfer
- Interdisciplinary view on other cooperating disciplines
- Intercultural perspective of design codes - the German Look compared to other country looks.
- Design history of product design with a great holistic view
- German Product Design in History and Organs in Design (Peter Behrens, Dieter Rams, Deutsche Werkbund, Rat für Formgebung, DGTF a.o.)
- Design Seals and Awards (IF Design, Red Dot Design)
- International Awards and Fashion/ Textile-Industry in case of sustainability
- Design medias and The Medium is The Message (Marshall McLuhan)
- Design is communicating, Transfer with exercises: as fashion journalist, fashion expert
- Graphic Design as tool for design manager - Info graphics to storytelling
- Visits of fairs - TechTextil Frankfurt, Orgatec Fair cologne, museums, DMI ...?
- it is up to the students interest and engagement
- Looking back on the seminar to prepare the examination - e.g. with the help of an exercise to Corporate Textiles I: Corporate Fashion - Design a Unisex-T-Shirt: 1. Looking back at the seminar: what is good design - how to communicate design expertise, 2. CI and CC of the University HN Fb 07, 3. New smart textiles 4. a claim to promote the textile and fashion competence, documentation and arguments/statement)

Selection of Literature: (please see the handset at the library at Mg)

English literature:
Conran Octopus and Design Museum, 2010, Fifty Dresses that changed the world, Octopusbooks UK.
Cosgrave, Bronwyn, 2000, The complete history of Costume & Fashion - form ancient egypt tot he present day, Checkmark Books, UK.
O’Mahony, Marie und Sarah E. Braddock, 2002 Sportstech, London: Thames and Hudson.
Reed, Paula, 2012, Fifty Fashion Looks that changed the 1970s, Octopusbooks UK.
Zwimpfer, Moritz, 2001, 2d visual perception, Zürich: Niggli (german/english).

Literature Francaise:
Bordet, Pascale, 2010, cahiers secrets d’une costumière de théâtre, HC editions.
Jean Paul Gaultier, 2015, Katalog zur Ausstellung in Montréal, Kanada.


Rübel, Dietmar u.a. (Hg.), Materialästhetik-Quellentexte zu Kunst, Design, Architektur, Berlin: Reimer.


Others:

Form, Wallpaper, Frame, Textil Wirtschaft

VOGUE und Hapers Bazaar, GQ


Relevant blogs, movies and websites will be announced at each lesson of the seminar.
Colour Theory

Content

- Introduction: What is Colour?, What is Light?
- What about design trends in colouring your life
- Physical and psychological conditions to see colour and - coloured objects
- Perception and effects of light-surface-design object in three-dimensional ways
- Analyse determining factors of colours in order to categorise them into different colour systems and to develop applicable criteria of
- Colour systems and colour evaluation.
- Law of perception and creation of design
- Applications, - Media of Textiles and of Art, Surfaces, Light and Media (like photography)
- Pre conditional phase and cultural imprint during the childhood to look on design objects
- Function of the eye
- Colour contrasts by Johannes Itten, the colour circle - how to create mixed colours
- Aesthetic values, - cultural codes, design roots
- Colour systems in practise (RAL, CNS, Pantone)
- Colour and material archive /labs.
- Colour in info graphic to create some
- Exercises: communicate with the help of colour in analogue and digital media
- Design Driven Innovation and other methods of design
- Colour Design Management in Design (for textile prints)
- Exercises: research in material labs, colour labs and with field studies with interviews of textile experts
- Design is communicating, Transfer with exercises: as fashion journalist, fashion expert
- Graphic Design as tool for design manager - Info graphics to storytelling
- Visits of fairs and trend boards and museums
it is up to the students interest and engagement
- Looking back on the seminar to prepare the examination - e.g. with the help of an exercise to fashioning the coloured future in Textiles: Design a pattern - for a Unisex-T-Shirt: 1. Looking back at the seminar: how to communicate with the help of colour - special effects (Razzel Dazzel) - design expertise, 2. CC of the University HN Fb 07, 3. New smart textiles with the help of new colouring methods in (3-D) printing4. a claim to promote the textile and fashion competence, documentation and arguments/statement)

Literature

Selection of Literature: (please see the handset at the library at Mg)

Gage, John, 1999, Color and meaning, Berkley: University of Carlifornia Press.
Harrison, John, 2001, Synaesthesia - the Strangest Thing, Oxford University Presse.
O’ Mahony, Marie und Sarah E. Braddock, 2002 Sportstech, London: Thames and Hudson.  
Zwimpfer, Moritz, 2006, Colorondo - A game with 80 colors, Niggli Verlag.  
Others:  
DMI-Trendbooks  
AD, Frame, Page
Module: TCM-380: Fashion Design

Language: English

Responsible: Prof. Dr. Marina-Elena Wachs

Workload:
- HpW 4
- CP 5
- 60h presence
- 43h preparation and follow-up work (exercises, literature, tutorials)
- 22h preparation for examination

Lectures

| Name: Multidimensional Design | HpW CP L SL Ex P Sem. |
| Teacher: Lehrbeauftragte | 2 2 2 0 0 0 5 |

Precondition:

| Name: Fashion Theory | HpW CP L SL Ex P Sem. |
| Teacher: Prof. Dr. Wachs, Marina-Elena | 2 3 2 0 0 0 5 |

Examinations

| Code No. | Name | Type | Examination |
| TCM-380 | Fashion Design | Pr | written exam |

Remarks
The term fashion design stands in relationship to medium of the object: fashion is communicating with different media. The students will reflect the relation about fashion design and multidimensional design, that needs consciousness about the power of three dimensional parameters in creating and communication the message. Symbolic functions of design are equal analysed than "the Look" of fashion.

In the basic lecture design theory and -history (fourth semester) you were introduced to essential aspects about "terms and definitions" of design theory, e.g. artefact, semantics of products, material and cultural codes related to question about: "What is design?, What is good design? What is the difference between product design and fashion design, the importance of CI and CD and CF=Corporate Fashion within design management."

"The making of design" and the design process we regarded in historian sources of other sections (Max Bill and other artists and architects).

In the following lectures on "fashion theory" and "multidimensional design" we will look at the perspective on fashion as well as on essential design skills of seeing and visual perception, take the perspective on fashion from a historical, psychological and sociological perspective with regard to elemental parameters to create fashion; the students will compare fashion with art and sciences to look at the meaning of dress codes, of clothes and fashion. Multidimensional design deals with design problems in the field of textile and clothing design, that means it provides the elements and principles in 2-D and 3-D Design. Further, it is to analyse the human behaviour of "wearing" clothes and look on the relationship to industry and society and hot to build a fashion code with the help of different medias.

Furthermore and in a more general sense, the term fashion design refers to a concept designed to improve everyday life and industrial life. The latest definitions of designs are multifarious and are partly still developing. Hence, the students of Textile- and Clothing Management will encounter at least different areas of design during their studies, which is dedicated to textile and fashion design in the traditional and professional sense of the word.

This involves the knowledge of history, theory and the developing of fashion design concepts. The students will be able to understand the basic laws of visual perception and fashion / design and assess their professional applications in the case of managing fashion and fashion retail with different media.

The multidisciplinary lecture offers a survey of the essential cultural theories investigating fashion as an integral part of human culture. It includes philosophical, historical, economic, sociological, and psychological theories as well as communication theory, all of which deal with different aspects of fashion. The students will discuss texts and images relating to the theories.

The students learn to identify and analyse essential and new fashion theories, which explain the phenomenon and process of fashion. They will be able to deliver examples and apply the theories to new situations. At the same time, the students will improve their critical and communicative abilities when they formulate and present their own opinion in class discussions and term papers.

The students know fashion design dimensions and are able to distinguish design in its various dimensions: historical, aesthetic, psychological, product specific, process-oriented.
Multidimensional Design

Multidimensional Design puts fashion in context with elements and principles of design. The elemental parameters a designer employs provide different visual impact. The knowledge of these components also assists in recognizing well-designed, marketable garments and in analyzing why they work. The course of lectures on multidimensional design is divided into two major sections:

Section 1 - Design elements
- Point & line
- Shape & volume
- Texture
- Space
- Motion
- Value

Section 2 - Design principles
- Harmony
- Emphasis
- Proportion
- Balance
- Rhythm

Literature

Tate, Sharon Lee. Inside Fashion Design. New Jersey: Pearson Education 2004
Itten, Johannes. Design and Form. The basic course at the Bauhaus and later. Ravensburg: Otto Maier Verlag 1975
Frutiger, Adrian: Der Mensch und seine Zeichen, Paris, 1978
Fashion Theory

Content

- Introduction: What is Fashion Theory - categories, terms, selection of experts literature!
- What is style? What are styles? The Fashion System in relevance to the thesis of Roland Barthes, Ingrid Loschek and other Fashion sociological views like Diane Crane and a "fashion-theoretical" view by Marina-E. Wachs
- Styles in history and today - trends
- Fashion History and "Fashion Behaviour" - terms (field study: the relevance of the corset)
- The influence of technical development - industrialisation and the consequences regarding to social changes. Classes and Fashion - working class to upper class...
  (influence of "espionage" and mobility to handcraft and of fashion industry- case study GB - Germany - Netherlands.)
- The influence of Art and Architecture on Fashion - Question of form, innovation and >Zeitgeist< - spirit of the time.
- Political impact like the World War and the influence of changing forms - materials - production processes - management and marketing.
- New materials, new design methods, transfer of other disciplines in Fashion
- Today: questions of consumer demands (e.g. >consumers need for uniqueness< and neuro-marketing...)
  on technical aspects in fashion and sustainability, smart textiles and others.
- Economical influence like system of sustainable handling, - production
  -"sustainable thinking" to "fashion thinking" (Wachs)
- >The medium is the message< (Marshall McLuhan, 1976) to Roland Barthes >Fashion System< (1965)
- Fashion and photography - "The Look" (case study Peter Lindbergh)
- Perception of fashion codes, e.g. on the street, corporate fashion, different media
- Sociological basics: Sennett to Simmel and Loschek.
- Influence of fairs and trends on fashionable forms and social behaviour on "la mode" /Couture and
  >ready-to-wear-clothing<
- The gender question in enterprises and the question about "inclusion" in Fashion
- Fashion and communication - graphical impact in fashion (generative fashion) and in telling the best story to sell fashion (as journalist, as textile expert, as manager)
- Exercises: practically and transdisciplinary: based on fashion in different jobs
- Exercises: scientific working / artistic research (fifth semester!)
- Info: literature, fairs, trade magazines, blogs, labs, organs of fashion studies.
- Offers: Visit and "Enterprise: Start-up?" -lecture by guest
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Literature

Selection of Literature: (please notice new books at the handset at the library in MG)
Crane, Diana, 2000, Fashion and its social agendas - Class, Gender And Identity in Clothing, Chicago und London: The University of Chicago Press. (BIB MG)
Krippendorf, Klaus, 2006, the semantic turn - a new foundation for design, CRC Press and Taylor & Francis

27.11.2017
Samesch, Stéphanie (Hg.), u.a., Corporate Identity und Corporate Design, AvEdition.

Others:
Baudrillard, Jean, 1991, (1968), Das System der Dinge. Über unser Verhältnis zu den alltäglichen Gegenständen, Reihe Campus, Frankfurt am Main: Campus
Bourdieu, Pierre, et Delsaut, Yvette, 1975, Le Couturier et sa griffe: Contribution à une théorie de la magie