Course Handbook Industrial Engineering Master

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Deputy Chairman of Examination	Prof. Dr. Rudolf Friedrich

Industrial Engineering Master - mandatory courses (overview)

Module name (EN)	**Code**	**Semester**	**Hours per semester week / Teaching method**	**ECTS**	**Module coordinator**
Applied Mathematics	WIMASc235	2	2V+2U	6	Prof. Dr. Frank Kneip
Colloquium	WIMASc335	3	-	3	Studienleitung
Corporate Management (Business Simulation Game) / Balance Sheet Analysis	WIMASc315	3	1SU+1V+2PA	6	Prof. Dr. Andy Junker
Economic and Social Science Elective Module	WIMASc155	1	2V+2U	6	Studienleitung
Electric Machines and Simulation	WIMASc135	1	2V+2U	6	Prof. Dr. Rudolf Friedrich
Engineering Science Elective Module	WIMASc255	2	2V+2U	6	Studienleitung

Free Elective Module	WIMASc355	3	2V+2U	6	Studienleitung
International Business Communication	WIMASc245	2	2V+2U	6	Prof. Dr. Thomas Tinnefeld
Manufacturing Technologies	WIMASc145	1	1V+1U+2PA	6	Prof. Dr.-Ing. Dieter Arendes
Quality Management / Cost Management	WIMASc215	2	2V+2U	6	Prof. Dr. Udo Venitz
Renewable Energies and Electrical Networks	WIMASc225	2	2V+2U	6	Prof. Dr. Rudolf Friedrich
Statistical Methods Put into Practice / Information and Communication Technology	WIMASc125	1	1SU+1V+1U+1PA	6	Prof. Dr. Frank Kneip
The Economic and Legal Framework of Economic Policy	WIMASc115	1	2V+2U	6	Prof. Dr. Markus Münter
Thesis	WIMASc325	3	-	15	Studienleitung

(14 modules)

Industrial Engineering Master - optional courses (overview)

Module name (EN)	Code	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator
"Engineering Visions" and Intercultural Experience Intensive Program	WIMAScWPF-Ing14	3	-	4	Prof. Dr. Frank Kneip
Assembly Technology	WIMAScWPF-Ing13	1	1V+1U	3	Prof. Dr.-Ing. Christian Köhler
Company Succession in Practice	WIMAScWPF-W7	2	1V+1PA	3	Prof. Dr. Andy Junker
Computational Fluid Dynamics (CFD)	WIMAScWPF-Ing12	3	2V+2U	6	Prof. Dr. Frank Ulrich Rückert
Energy Trading in Practice	WIMAScWPF-W15	-	-	3	Prof. Dr. Uwe Leprich
Factory and Logistics Planning	WIMAScWPF-Ing3	1	2V	3	Prof. Wilhelm Hauser
Financial Management	WIMAScWPF-W10	3	4V	6	Prof. Dr. Matthias Gröhl
Free-Choice Elective for Double-Degree-Program Students	WIMAScWPF-FÜ6	2	-	4	Studienleitung
Heat and Mass Transfer	WIMAScWPF-Ing11	2	2V+2U	6	Prof. Dr. Frank Ulrich Rückert
IT Project 1	WIMAScWPF-Ing1	2	2PA	3	Prof. Dr. Daniel F. Abawi

IT Projects 1+2	WIMAScWPF-Ing8	2	4PA	6	Prof. Dr. Daniel F. Abawi
Industry 4.0: Principles & Implementation	WIMAScWPF-W16	2	1V+1U	3	Prof. Dr.-Ing. Christian Köhler
Market and Business Processes in the Energy Transition	WIMAScWPF-FÜ4	-	2V	3	Prof. Dr. Uwe Leprich
Operations Management	WIMAScWPF-W6	1	1V+1U	3	Prof. Dr.-Ing. Christian Köhler
Simulating Forming Processes with an FEM Project	WIMAScWPF-Ing10	-	2V+2U	6	Prof. Dr.-Ing. Dieter Arendes
Simulation in Production and Logistics	WIMAScWPF-FÜ7	3	2V+2U	6	Prof. Dr. Thomas Bousonville
Strategic Management	WIMAScWPF-W4	1	1V+1PA	3	Prof. Dr. Malte Beinhauer
Technical Project	WIMAScWPF-Ing2	2	4PA	6	Prof. Dr. Dirk Hübner
Transformation of the Federal German Electricity System (Parts 1 & 2))	WIMAScWPF-W9	1	3V+1U	6	Prof. Dr. Uwe Leprich
Web-Based Knowledge Management	WIMAScWPF-FÜ8	3	4V	6	Prof. Dr. Stefan Georg

(20 modules)

Industrial Engineering Master - mandatory courses

Applied Mathematics

Module name (EN): Applied Mathematics
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMASc235
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 6
Semester: 2
Mandatory course: yes
Language of instruction: German
Assessment: Written exam
Curricular relevance: WIMASc235 Industrial Engineering, Master, ASPO 01.10.2014, semester 2, mandatory course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Frank Kneip

Lecturer:
Prof. Dr. Frank Kneip
[*updated 11.02.2020*]

Learning outcomes:
After successfully completing this module students will:
_ be proficient in solving nonlinear equations, can select a suitable solution method and be able to justify their choice.
_ be able to model suitable systems in the form of a linear equation system and identify unknown parameters based on given measurement data.
_ be able to describe the principles of state estimation and time series analysis using hidden Markov models and reproduce known examples, as well as adapt the methods to similar systems.
_ be able to implement the algorithms learned in Matlab
_ be able to interpret their results and check their plausibility
[*updated 18.12.2018*]

Module content:
1. Numerical methods: solving nonlinear equations
1.1. Bisection method
1.2. Fixed-point iteration
1.3. Secant method
1.4. Newton´s method
1.5. Accuracy and termination criteria
1.6. Convergence characteristics
1.7. Applications

2. Parameter estimation: linear equalization
2.1. Modeling
2.2. Method of least squares
2.3. Weighted least squares
2.4. Recursive least squares
2.5. Applications

3. State estimation and time series analysis: hidden Markov models
3.1. Definition and modeling hidden Markov models
3.2. Forward algorithm
3.3. Backward algorithm
3.4. Viterbi algorithm
3.5. Baum-Welch algorithm
3.6. Applications
[*updated 18.12.2018*]

Teaching methods/Media:
Presentation with projector, lecture notes, blackboard, PC, Matlab/Simulink, computer-aided exercises
[*updated 18.12.2018*]

Recommended or required reading:

_ Dahmen, W., Reusken, A.: Numerik für Ingenieure und Naturwissenschaftler; 2. Auflage, Springer, 2008

_ Gramlich, G., Werner, W.: Numerische Mathematik mit Matlab; dpunkt verlag, 2000

_ Björck, A.: Numerical Methods for Least Squares Problems; Society for Industrial and Applied Mathematics (SIAM), 1996

_ Rabiner, L. R.: A Tutorial on Hidden Markov Models and Selected Applications in Speech Recognition; Proceedings of the IEEE, Band 77, Nr. 2, S. 257_286, 1989

_ Fraser, A. M.: Hidden Markov Models and Dynamical Systems; Society for Industrial and Applied Mathematics (SIAM), 2009

[*updated 18.12.2018*]

Colloquium

Module name (EN): Colloquium
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMASc335
Hours per semester week / Teaching method: -
ECTS credits: 3
Semester: 3
Mandatory course: yes
Language of instruction: German
Assessment: Class presentation and oral examination
Curricular relevance: WIMASc335 Industrial Engineering, Master, ASPO 01.10.2014, semester 3, mandatory course
Workload: The total student study time for this course is 90 hours.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Studienleitung
Lecturer: Studienleitung [*updated 16.02.2013*]

Learning outcomes:
_ The student will be able to present the essential contents and findings of his/her thesis to a scientific audience from other fields.
_ Students will answer questions based on their presentation from the audience.
_ Students will also be able to discuss questions belonging to the field of industrial engineering and questions related to their thesis topic.
_ Students will present the course of their research, position themselves with regard to their solution and justify their solution in the discussion.
[*updated 18.12.2018*]

Module content:
In a short presentation - held freely - students will explain the objectives, content and results of their thesis. Then the examiners and other scientific listeners will pose questions regarding the theses, its content, methods and theories. The presentation itself and the student´s answers during the discussion will be evaluated.

The thesis defense should not exceed 45 minutes plus the subsequent discussion.

In principle, it is possible to hold the colloquium as an open event, so that, among other things, representatives of the companies that made it possible for the student to work on their topic, but also representatives of the press, can participate in the colloquium. In this way, the industrial engineering group can also contribute to the public debate. The colloquium can also take place in the company that selected the topic of the thesis.
[*updated 18.12.2018*]

Teaching methods/Media:
Presentation with projector, flip chart, slides, notebook, blackboard
[*updated 18.12.2018*]

Recommended or required reading:
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[*updated 18.12.2018*]

Corporate Management (Business Simulation Game) / Balance Sheet Analysis

Module name (EN): Corporate Management (Business Simulation Game) / Balance Sheet Analysis
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMASc315
Hours per semester week / Teaching method: 1SU+1V+2PA (4 hours per week)
ECTS credits: 6
Semester: 3
Mandatory course: yes
Language of instruction: German
Assessment: Project work, term paper and presentation (1:1)
Curricular relevance: WIMASc315 Industrial Engineering, Master, ASPO 01.10.2014, semester 3, mandatory course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Andy Junker

Lecturer:
Prof. Dr. Andy Junker
Lehrbeauftragte
[*updated 20.01.2020*]

Learning outcomes:
Business Simulation Game:
The participants will apply their knowledge of business administration as a basis for making business decisions. Using the TOPSIM software, competitive situations and market conquest strategies will be realistically mapped. Theoretical basics will be implemented in the simulation and students will become acquainted with the factors that can influence success.
Students will apply the effects of marketing measures to the competitive situation on the (fictitious) market.
After successfully completing this module students will:
_ be able to derive lower and upper price limits.
_ be able to make a decision when bottlenecks occur.
_ be able to regularly assess their cash flow and prepare a liquidity forecast.

Balance Sheet Analysis/Planning:
After successfully completing this module students will:
_ be able to interpret a balance sheet. They will be able to scrutinize balance sheet items and show how to calculate them using examples. Cost accounting skills will be combined and used to evaluate works-in-progress and provisions for anticipated losses (HGB), while theoretical investment knowledge will be used to determine the correct value of company investments (also in accordance with IFRS).
_ know the decisive parameters for deriving a balance sheet from revenue planning. They will have internalized the differences between the assets, finances and earnings of a company.
_ Students will be proficient in independently analyzing annual financial statements with regard to material findings and carrying out plausibility checks.
[*updated 18.12.2018*]

Module content:
Business Simulation Game:
Various planning periods will be simulated under changing market conditions. Knowledge of economic basics will be intensified in the discussions that take place between the individual decision rounds of the business management simulation. In addition, the lecturer will be available to students for support, when needed. Last but not least, the discussion of the results of the business simulation together with the lecturer will help students process and classify what they experienced and learned from the simulation.

Balance Sheet Analysis/Planning:
1. Valuation of investments
2. Valuation of work-in-progress (WIP)
3. Calculation and valuation of provisions for contingent losses
4. Selected parameters of balance sheet planning
5. Independent balance sheet analysis of selected companies (in written form)

[*updated 18.12.2018*]

Teaching methods/Media:
Business Simulation Game:
PC simulation; presentations with projector, flip-chart

Balance Sheet Analysis/Planning:
Presentation with projector, flip chart, blackboard
[*updated 18.12.2018*]

Recommended or required reading:
Business Simulation Game:
_ Participant manual Topsim
Balance Sheet Analysis/Planning:
_ Küting, K. / Weber, C.P.: Die Bilanzanalyse; latest edition
_ Reichmann, T.: Controlling mit Kennzahlen; latest edition
_ Copeland, T. u.a.: Unternehmenswert; latest edition
_ Horvath, P. / Gleich, R.: Neugestaltung der Unternehmensplanung; latest edition
_ Bieg, H. / Kußmaul, H. / Waschbusch, G.: Externes Rechnungswesen; latest edition
[*updated 18.12.2018*]

Economic and Social Science Elective Module

Module name (EN): Economic and Social Science Elective Module
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMASc155
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 6
Semester: 1
Mandatory course: yes
Language of instruction: German
Assessment: See the module description for the respective compulsory elective module; the type of examination will be announced by the lecturer at the beginning of the course.
Curricular relevance: WIMASc155 Industrial Engineering, Master, ASPO 01.10.2014, semester 1, mandatory course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Studienleitung

Lecturer: Studienleitung
[*updated 16.02.2013*]

Learning outcomes:
After successfully completing this module, students will be able to evaluate a new subject area from the fields of economics, social sciences or other closely related fields at master level with regard to its use, applicability and limits. Students will be able to lay the foundation for this course themselves (i.e. acquire the necessary basic knowledge themselves).

For more details, see the module description for the respective compulsory elective module.
[*updated 18.12.2018*]

Module content:
Students will concentrate on a subject relevant to the Master´s program in Industrial Engineering. The topic should be of current interest in business practice or research.

For more information, see the module description for the respective compulsory elective module.
[*updated 18.12.2018*]

Teaching methods/Media:
See the module description for the respective compulsory elective module.
[*updated 18.12.2018*]

Recommended or required reading:
See the module description for the respective compulsory elective module.
[*updated 18.12.2018*]

Electric Machines and Simulation

Module name (EN): Electric Machines and Simulation
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMASc135
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 6
Semester: 1
Mandatory course: yes
Language of instruction: German
Assessment: Written exam
Curricular relevance: WIMASc135 Industrial Engineering, Master, ASPO 01.10.2014, semester 1, mandatory course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for: WIMASc225 Renewable Energies and Electrical Networks [*updated 10.02.2020*]
Module coordinator: Prof. Dr. Rudolf Friedrich

Lecturer:
Prof. Dr. Rudolf Friedrich
Prof. Dr. Frank Kneip
[*updated 10.02.2020*]

Learning outcomes:
Electric Machines:
After successfully completing this module students will:
_ know the theoretical and physical basics of electric machines.
_ be familiar with the different types and designs of rotating electric machines.
_ be able to explain the different modes of operation, areas of application and operating characteristics of rotating machines, as well as their characteristics.
_ be familiar with the different types and designs of static electric machines and their modes of operation and operating behavior.
_ be able to select electric machines for specific applications taking into account their respective operating behavior and their competence for solving simple tasks in the field of electric machines.

Simulation:
After successfully completing this module students will:
_ be able to implement a DC motor model and a modeled load in Matlab/Simulink.
_ be able to select the signals relevant to solving specific problems, record them as measured variables and evaluate them.
_ be able to analyze and interpret the behavior of an engine using selected signals in the context of the overall system.
_ be able to analyze cause-effect relationships in the overall system and evaluate the influence of individual parameters.
_ be able to design and implement a control strategy for a DC motor depending on specific measurement and control options.
[*updated 18.12.2018*]

Module content:
Electric Machines:
1. Physical structure and configuration of an electric machine
1.1. Classifying electric machines
1.2. Areas of application of electric machines
1.3. Physical principles
2. DC machine
2.1. Physical structure
2.2. Functionality
2.3. Operating behavior and characteristics
2.4. Technical realization
3. Transformer
3.1. Physical structure
3.2. Functionality
3.3. Operating behavior and characteristics
3.4. Technical realization
4. Asynchronous machines
4.1. Slip ring and squirrel cage rotors
4.2. Physical structure
4.3. Functionality
4.4. Operating behavior and characteristics
4.5. Technical realization
5. Synchronous machine
5.1. Salient pole and non-salient pole generators
5.2. Physical structure
5.3. Functionality
5.4. Operating behavior and characteristics
5.5. Technical realization
6. Universal motor
7. Torque converter/asynchronous machine in stationary condition

Simulation:
1. Developing a simulation model for DC motors
2. Modeling and simulating load cases
3. Determining static characteristic curves from simulation data
4. Analyzing dynamic behavior and cause-effect relationships
5. Influence of tolerances and parameter variation
6. Simulating control strategies

Presentation with projector, lecture notes, blackboard, PC, Matlab/Simulink, computer-aided experiments
[*updated 18.12.2018*]

Recommended or required reading:
Electric Machines:
_ Spring, E.: Elektrische Maschinen - eine Einführung; 3. Auflage, Springer Verlag, 2009
_ Fischer, R.: Elektrische Maschinen; 15. Auflage, Carl Hanser-Verlag, 2011
_ Seefried, E. / Mildenberger, O.: Elektrische Maschinen und Antriebstechnik - Grundlagen und Betriebsverhalten; 1. Auflage, Vieweg Verlag, 2001

Simulation:
_ Nollau, R.: Modellierung und Simulation technischer Systeme _ Eine praxisnahe Einführung; 1. Auflage, Springer Verlag, 2009
_ Schröder, D.: Elektrische Antriebe _ Grundlagen; 4. Auflage, Springer Verlag, 2009
_ Schröder, D.: Elektrische Antriebe _ Regelung von Antriebssystemen; 3. Auflage, Springer Verlag, 2009
_ Isermann, R.: Mechatronische Systeme _ Grundlagen; 2. Auflage, Springer Verlag, 2008
_ RRZN Handbuch: Matlab/Simulink; 4. Auflage, 2012
[*updated 18.12.2018*]

Engineering Science Elective Module

Module name (EN): Engineering Science Elective Module
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMASc255
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 6
Semester: 2
Mandatory course: yes
Language of instruction: German
Assessment: See the module description for the respective compulsory elective module; the type of examination will be announced by the lecturer at the beginning of the course.
Curricular relevance: WIMASc255 Industrial Engineering, Master, ASPO 01.10.2014, semester 2, mandatory course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Studienleitung

Lecturer: Studienleitung
[*updated 16.02.2013*]

Learning outcomes:
After successfully completing this module, students will be able to evaluate a new subject area from the fields of engineering, mathematics or computer science at master level with regard to its use, applicability and limits. They will compile the basics on their chosen subject themselves.

For more details, see the module description for the respective compulsory elective module.
[*updated 18.12.2018*]

Module content:
Students will concentrate on a subject relevant to the Master´s program in Industrial Engineering. The topic should be of current interest in business practice or research.

For more information, see the module description for the respective compulsory elective module.
[*updated 18.12.2018*]

Teaching methods/Media:
See the module description for the respective compulsory elective module.
[*updated 18.12.2018*]

Recommended or required reading:
See the module description for the respective compulsory elective module.
[*updated 18.12.2018*]

Free Elective Module

Module name (EN): Free Elective Module
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMASc355
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 6
Semester: 3
Mandatory course: yes
Language of instruction: German
Assessment: See the module description for the respective compulsory elective module; the type of examination will be announced by the lecturer at the beginning of the course.
Curricular relevance: WIMASc355 Industrial Engineering, Master, ASPO 01.10.2014, semester 3, mandatory course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Studienleitung

Lecturer: Studienleitung
[*updated 16.02.2013*]

Learning outcomes:
After successfully completing this module, students will be able to evaluate a new subject area at master level with regard to its use, applicability and limits. Students will be able to lay the foundation for this course themselves (i.e. acquire the necessary basic knowledge themselves).

For more information, see the module description for the respective compulsory elective module.
[*updated 18.12.2018*]

Module content:
Students will concentrate on a subject relevant to the Master´s program in Industrial Engineering. The topic should be of current interest in business practice or research.

For more information, see the module description for the respective compulsory elective module.
[*updated 18.12.2018*]

Teaching methods/Media:
See the module description for the respective compulsory elective module.
[*updated 18.12.2018*]

Recommended or required reading:
See the module description for the respective compulsory elective module.
[*updated 18.12.2018*]

International Business Communication

Module name (EN): International Business Communication
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMASc245
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 6
Semester: 2
Mandatory course: yes
Language of instruction: English
Assessment: Term paper with presentation
Curricular relevance: WIMASc245 Industrial Engineering, Master, ASPO 01.10.2014, semester 2, mandatory course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for: WIMAScWPF-Ing12 Computational Fluid Dynamics (CFD) WIMAScWPF-Ing14 "Engineering Visions" and Intercultural Experience Intensive Program WIMAScWPF-W10 Financial Management [*updated 11.02.2020*]

Module coordinator:
Prof. Dr. Thomas Tinnefeld

Lecturer:
Prof. Dr. Thomas Tinnefeld
[*updated 11.02.2020*]

Learning outcomes:
After successfully completing this module students will:
_ be able to deal with selected business situations in an international context.
_ have acquired in-depth knowledge of written foreign-language communication skills, including the technical terminology from relevant professional fields.
_ have deepened and expanded their oral communication skills in an exclusively English learning atmosphere through active participation in discussions and talks at an intermediate to high level.
_ be able to understand complex texts with economic or technical content by capturing the implicit meaning contained in them.
_ have deepened their understanding of the intercultural character of international business communication.
[*updated 18.12.2018*]

Module content:
_ This course will address topics that are interculturally relevant for international business communication, such as:
- Essentials of international business communication
- Small talk
- Applying for a job
- Succeeding in job interviews
- Social skills
- Socializing
- Meetings and negotiations
- Managing people
- Advertising

_ Consideration of all four language skills (speaking, writing, listening, reading)
_ Advanced, subject-related, specialized grammar and techniques
[*updated 18.12.2018*]

Teaching methods/Media:
_ Lecturer presentation phases
_ Group and plenary discussions
_ Partner work
_ Multimedia language lab
_ Presentations and short talks by students
[*updated 18.12.2018*]

Recommended or required reading:

_ Teaching materials compiled by the lecturer
_ PowerPoint presentations by the lecturer or equivalent visualization forms
_ Lecturer´s learning platform
_ Grammars and exercise books recommended in the course
_ Internet resources

[*updated 18.12.2018*]

Manufacturing Technologies

Module name (EN): Manufacturing Technologies
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMASc145
Hours per semester week / Teaching method: 1V+1U+2PA (4 hours per week)
ECTS credits: 6
Semester: 1
Mandatory course: yes
Language of instruction: German
Assessment: Oral examination and project work (1:1)
Curricular relevance: WIMASc145 Industrial Engineering, Master, ASPO 01.10.2014, semester 1, mandatory course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for: WIMASc215 Quality Management / Cost Management WIMAScWPF-W16 Industry 4.0: Principles & Implementation WIMAScWPF-W18 [*updated 11.02.2020*]

Module coordinator:
Prof. Dr.-Ing. Dieter Arendes

Lecturer:
Prof. Dr.-Ing. Dieter Arendes
[*updated 20.01.2020*]

Learning outcomes:
After successfully completing this module students will:
_ have in-depth knowledge about selected manufacturing processes, which goes beyond the basic knowledge from the Bachelor´s program, especially in the field of forming technology and automotive engineering.
_ be able to carry out basic calculations on forces and tool loads, among other things.
_ be familiar with the holistic engineering approach to lightweight structures and can explain the connections between material, production and design in technical discussions.
_ have the methodological knowledge required for working out the technological details of manufacturing processes and be aware of their importance for the respective manufacturing process.
_ have acquired knowledge about strategies and ways of familiarizing themselves with individual technological topics through literature research, patent research and interview techniques in manufacturing operations.
[*updated 18.12.2018*]

Module content:
1. Processes and special technologies for sheet metal forming, in particular for the automotive industry
2. Machines, installations and tools for sheet metal forming
3. Introduction to lightweight construction: manufacturing processes, materials and design
4. Project work: analysis and in-depth study of individual manufacturing processes, as well as the precise description and presentation of respective special features with an emphasis on new technologies in the sense of a "technology watch" and on actual problems of industrial partners.
[*updated 18.12.2018*]

Teaching methods/Media:
Presentation with projector, Internet, literature databases, PC, sample parts
[*updated 18.12.2018*]

Recommended or required reading:

_ Doege, E.; Behrens B.-A., Handbuch Umformtechnik: Grundlagen, Technologien, Maschinen, Springer, 2. Auflage, 2010

_ Koether, R./ Rau, W.: Fertigungstechnik für Wirtschaftsingenieure; 4. Auflage, Carl Hanser Verlag, 2012

_ König, W./ Klocke F.: Fertigungsverfahren, mehrere Bände, VDI-Verlag GmbH, Düsseldorf.

_ Lange, K.: Lehrbuch der Umformtechnik, mehrere Bände; 2. Auflage, Springer Verlag, 2002

_ Spur, G./ Stöferle, Th.: Handbuch der Fertigungstechnik, mehrere Bände, Karl-Hanser-Verlag.

_ Awiszus, B.: Grundlagen der Fertigungstechnik Carl Hanser Verlag, 5. Auflage, 2012

_ Westkämper, E. / Warnecke H.-J.: Einführung in die Fertigungstechnik, Vieweg+Teubner Verlag; 8. Auflage, 2010

_ Hellwig, W.: Spanlose Fertigung: Stanzen, Vieweg+Teubner Verlag; Auflage: 9, 2009

_ Tschätsch H.: Praxis der Umformtechnik: Arbeits-verfahren, Maschinen, Werkzeuge, Vieweg+Teubner Verlag; Auflage: 9,. 2008

_ Klein, B.: Leichtbau-Konstruktion: Berechnungsgrund-lagen und Gestaltung, Vieweg+Teubner Verlag; Auflage: 9. 2012

Students are expected to find the most up to date literature for their project work themselves. They will be instructed on how to do so.
[*updated 18.12.2018*]

Quality Management / Cost Management

Module name (EN): Quality Management / Cost Management
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMASc215
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 6
Semester: 2
Mandatory course: yes
Language of instruction: English/German
Assessment: Written exam (for Quality Management), class presentation (written composition and presentation) (for Cost Management) (1:1)
Curricular relevance: WIMASc215 Industrial Engineering, Master, ASPO 01.10.2014, semester 2, mandatory course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): WIMASc125 Statistical Methods Put into Practice / Information and Communication Technology WIMASc145 Manufacturing Technologies WIMAScWPF-W6 Operations Management [*updated 10.02.2020*]
Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Udo Venitz

Lecturer:
Prof. Dr. Stefan Georg
Prof. Dr.-Ing. Christian Köhler
[*updated 10.02.2020*]

Learning outcomes:
Quality Management:
After successfully completing this module students will:
_ have an overview of the importance of quality as a competitive and cost factor.
_ be able to apply the underlying standards (ISO 9000 ff; TS 16949.) in a targeted manner.
_ be able to build a basic QMS and design core and support processes in accordance with standards.
_ have mastered the current techniques and instruments for efficient process documentation (e.g. VISIO; ARIS, ...).
_ have practiced auditor techniques and can prepare internal and external audits.
_ be able to transfer their technical know-how to other management systems (environmental protection, occupational safety, etc.).
_ be able to describe the differences in the requirements of different industries (automotive, food, pharmaceutical industry) in a qualified way.

Cost Management:
After successfully completing this module students will:
_ be familiar with the problems of classical cost accounting and the tasks and objectives of cost management that can be derived from them.
_ have mastered the methodology of fixed cost management and can transfer it to case studies.
_ have mastered the structure of process cost management and target cost management and can implement both methods.
_ know the structure of a product life cycle calculation and can distinguish it from investment calculations.
[*updated 18.12.2018*]

Module content:
Quality Management:
1. Basics
2. Product liability
3. Basic standards (ISO 9000, TS 16949)
4. Developing a quality management system
5. Q process design and documentation
6. Process documentation software
7. Auditing and auditing techniques
8. Integrated management systems
9. Industry-specific QMS

Cost Management:
1. Cost Management in the field of controlling
2. Managing fixed costs
3. Managing process costs
4. Managing target costs
5. Product life cycle calculation

[*updated 18.12.2018*]

Teaching methods/Media:
Quality Management:
A regularly revised PowerPoint presentation, also available to students as electronic lecture notes, will be used for the module. On a case-by-case basis, video sequences will illustrate what has been learned in the course of the module.

Cost Management:
Presentation with projector, flip chart, blackboard
[*updated 18.12.2018*]

Recommended or required reading:

Quality Management:

_ Brunner, F.J. / Wagner, K.W.: Quality Management: Leitfaden für Studium und Praxis; 5. Auflage, Carl Hanser Verlag, 2010

_ Cassel, M.: ISO 9001 _ QM prozessorientiert umsetzen; 1. Auflage, Carl Hanser Verlag, 2007

_ Cassel, M.: ISO/TS 16949 _ QM in der Automobilindustrie umsetzen; 1. Auflage, Carl Hanser Verlag, 2007

_ Hering, E./Triemel, J./Blank, H.-P.: Qualitätsmanagement für Ingenieure; 5. Auflage, Springer Verlag, 2002

_ Linß, G.: Qualitätsmanagement für Ingenieure; 3. Auflage, Carl Hanser Verlag, 2011

_ Masing, W. (Hrsg.): Handbuch Qualitätsmanagement; 5. Auflage, Hanser Verlag, 2007

_ Müller, D. / Tietjen, T. / Decker, A.: FMEA Praxis; Carl Hanser Verlag, 3. Auflage, 2011

_ Schmitt, R. / Pfeiffer T. (Hrsg.): Handbuch Qualitätsmanagement, 5. Auflage, Carl Hanser Verlag, 2007

_ Saatweber, J.: Kundenorientierung durch Quality Function Deployment; 3. Auflage, Symposing Publishing, 2011

_ Zollondz, H.-D.: Grundlagen Qualitätsmanagement; 3. Auflage, Oldenbourg Verlag, 2011

Cost Management:

_ Coenenberg, A.G. / Fischer, T.M. / Günther, T.: Kostenrechnung und Kostenanalyse; 8. Auflage, Schäffer-Poeschel, 2012

_ Georg, S.: Anwendungsorientiertes Controlling; 2. Auflage, Mandarin-Verlag, Saarbrücken, 2011

_ Müller, A. / Uecker, P. / Zehbold, C. (Hrsg.): Controlling für Wirtschaftsingenieure; 2. Auflage, Carl Hanser Verlag, 2006

_ Kremin-Buch, B.: Strategisches Kostenmanagement: Grundlagen und moderne Instrumente Mit Fallstudien; 4. Auflage, Gabler Verlag, 2012

[*updated 18.12.2018*]

Renewable Energies and Electrical Networks

Module name (EN): Renewable Energies and Electrical Networks
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMASc225
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 6
Semester: 2
Mandatory course: yes
Language of instruction: German
Assessment: Written exam resp. written composition with presentation
Curricular relevance: WIMASc225 Industrial Engineering, Master, ASPO 01.10.2014, semester 2, mandatory course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): WIMASc135 Electric Machines and Simulation [*updated 10.02.2020*]
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Rudolf Friedrich

Lecturer:
Prof. Dr. Rudolf Friedrich
Lehrbeauftragte
[*updated 10.02.2020*]

Learning outcomes:
After successfully completing this module students will:
_ have basic technical knowledge of supply networks and installations
_ be able to describe the structure, functionality and operating behavior of the various facilities, as well as their interaction in power supply infrastructures.
[*updated 18.12.2018*]

Module content:
1. Cross-divisional principles of supply networks
2. Electrical power supply
_ Electrical substations
_ Grid stations
_ Power lines
_ Cables
3. Gas supply
_ Gas pressure regulating stations
_ Pipelines
_ Gas storage
4. Water supply
_ Water catchment
_ Water treatment and storage
_ Water distribution (pipe networks)
5. District heating
[*updated 18.12.2018*]

Teaching methods/Media:
Printed script (updated regularly), additional practical examples; exercises based on technical case studies and planning tasks
[*updated 18.12.2018*]

Recommended or required reading:
_ Homann, K./ Hüning, R.: Handbuch der Gas-Rohrleitungstechnik, 2. Auflage, Oldenbourg Verlag
_ Mutschmann, J./ Stimmelmayr F.: Taschenbuch der Wasserversorgung, 13. Auflage, Vieweg-Verlag
_ Cerbe G.: Grundlagen der Gastechnik, 7. Auflage, Hanser-Verlag
_ Lindner, H./ Brauer, H./ Lehmann, C.: Taschenbuch der Elektrotechnik und Elektronik, 9. Auflage, Carl Hanser Verlag, 2008
_ Haubrich, H.-J.: Elektrische Energieversorgungssysteme, Verlag der Augustinus Bhg, 1997
_ Heuck, Dettmann _Energietechnik_, Vieweg-Teubner, 8.Auflage
_ Energie in Deutschland - BMWi
[*updated 18.12.2018*]

Statistical Methods Put into Practice / Information and Communication Technology

Module name (EN): Statistical Methods Put into Practice / Information and Communication Technology
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMASc125
Hours per semester week / Teaching method: 1SU+1V+1U+1PA (4 hours per week)
ECTS credits: 6
Semester: 1
Mandatory course: yes
Language of instruction: German
Assessment: Written exam for Statistical Methods, project work for Information and Communication Technology (1:1)
Curricular relevance: WIMASc125 Industrial Engineering, Master, ASPO 01.10.2014, semester 1, mandatory course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.

Recommended as prerequisite for:
WIMASc215 Quality Management / Cost Management
WIMAScWPF-Ing1 IT Project 1
WIMAScWPF-Ing8 IT Projects 1+2
[*updated 10.02.2020*]

Module coordinator:
Prof. Dr. Frank Kneip

Lecturer:
Prof. Dr. Frank Kneip
Prof. Dr. Susan Pulham
[*updated 20.01.2020*]

Learning outcomes:
Statistical Methods Put into Practice:
After successfully completing this module students will:
_ be able to solve problems in descriptive statistics using the appropriate methods
_ be able to solve problems in inductive statistics using the appropriate methods
_ be able to classify the most important probability distributions and solve concrete problems with them.
_ be able to solve complex practical problems using specific software (Excel, SPSS)
_ be able to understand and critically evaluate empirical studies by third parties

Information and Communication Technology:
After successfully completing this module students will:
_ be able to model business processes with UML
_ know the scope and structure of a specification sheet
_ be able to analyze business problems with regard to application-supported IT support
_ have experience in handling IT-supported tools for team-based IT development projects
_ be able to apply IT project management methods
_ have advanced knowledge in an object-oriented programming language (e.g. Java)
[*updated 18.12.2018*]

Module content:
Statistical Methods Put into Practice:
1. Statistical induction
2. Correlation analysis
3. _Regression analysis
4. Factor analysis
5. Cluster analysis

Information and Communication Technology:
Students will work in teams to find an IT-supported solution to a business-oriented task. To do so, they must analyze the task and create a concept for its solution. They will then create an application prototype based on their concept.
1. Structured analysis
2. Specifications and requirements
3. Software and process modeling with UML
4. Project management in an IT project
5. Tools for creating software in teams
6. Introducing / rolling out IT systems

[*updated 18.12.2018*]

Teaching methods/Media:
Statistical Methods Put into Practice:
Lecture with slides and computer-aided exercises

Information and Communication Technology:
Projector, slides, lecture notes. Only open source software will be used.
[*updated 18.12.2018*]

Recommended or required reading:
Statistical Methods Put into Practice:
_ P. P. Eckstein: Angewandte Statistik mit SPSS: Praktische Einführung für Wirtschaftswissenschaftler, 7. Auflage, Wiesbaden, 2012.
_ S. Pulham: Statistik leicht gemacht, Wiesbaden, 2011.

Information and Communication Technology:
_ Ullenboom, Christian: Java ist auch eine Insel, 10. Auflage, Galileo OpenBook 2011
_ Herold, H.; Lurz, B.; Wohlrab, J.: Grundlagen der Informatik, Pearson Studium Verlag, 2011
_ Sommerville, I.: Software Engineering, 9. Auflage, Pearson Studium, 2012
_ Rechenberg, P./ Pomberger, G.: Informatik-Handbuch, 4. Auflage, Carl Hanser Verlag, 2006

[*updated 18.12.2018*]

The Economic and Legal Framework of Economic Policy

Module name (EN): The Economic and Legal Framework of Economic Policy
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMASc115
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 6
Semester: 1
Mandatory course: yes
Language of instruction: German
Assessment: Written exam and composition with presentation (3:1)
Curricular relevance: WIMASc115 Industrial Engineering, Master, ASPO 01.10.2014, semester 1, mandatory course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Markus Münter

Lecturer:
Prof. Dr. Holger Buck
Prof. Dr. Markus Münter
[*updated 20.01.2020*]

Learning outcomes:
After successfully completing this module students will:
_ have a good command of the general economic principles of economic policy.
_ be able to distinguish between the normative foundations of different economic policy approaches and their legal implementation
_ have an overview of the entire spectrum of legal and institutional foundations, as well as the instruments and protagonists in selected policy fields
_ be able to classify current economic policy case studies and understand them both economically and legally
_ be able to analyze individual economic policy problem areas in depth and develop approaches to solving them
_ With regard to competition law, students will be able to solve basic legal cases independently; they will also be familiar with the typical course of a competition dispute and the registration procedure for the technical property rights important in production and distribution.
[*updated 18.12.2018*]

Module content:
The Economic Framework Conditions of Economic Policy:
1. Theoretical principles of economic policy
2. Competition policy: current problems and solutions
3. Environmental policy: current problems and solutions
4. Fiscal and asset policy
5. Foreign Trade/Globalization

The Legal Framework of Economic Policy:
1. An overview of economic constitutional and administrative law; The "Four Freedoms" of the EU
2. Competition law: Components of German and EU competition law; Competition disputes; Antitrust law in Germany and the EU (including leniency policy); Main features of EU state aid law; Overview of intellectual property law (German, European and international law); Technical property rights (German patent and utility model law)
3. Overview of public procurement law
4. Environmental law: Overview of environmental law (including waste, emmission control and environmental impact assessment law); Energy law with unbundling
5. Overview of social law with pension and health insurance law
6. Tax law: Budget law; Inheritance tax law
7. Foreign trade law at a glance; Bilateral and multilateral agreements, WTO law
[*updated 18.12.2018*]

Teaching methods/Media:
Student presentations will form a large part of the course and be discussed with the other participants; Beamer presentations; Short films; Legal practice cases and their solutions [*updated 18.12.2018*]

Recommended or required reading:
Basic literature on economic policy

_ Ahrns, H.-J. / Feser, H.-D.: Wirtschaftspolitik: Problemorientierte Einführung; 7. Auflage, Oldenbourg Wissenschaftsverlag, 1997

_ Bender, D. u.a.: Vahlens Kompendium der Wirtschaftstheorie und Wirtschaftspolitik; 9. Auflage, Vahlen, 2007

_ Frey, B. S. / Kirchgässner, G.: Demokratische Wirtschaftspolitik _ Theorie und Anwendung; 3. Auflage, Vahlen, 2009

_ Heise, A.: Einführung in die Wirtschaftspolitik. Grundlagen, Institutionen, Paradigmen, Wilhelm Fink Verlag 2005

_ Koch, W. S. / Czogalla, C.: Grundlagen und Probleme der Wirtschaftspolitik; 2. Auflage, Lucius & Lucius, 2004

_ Mussel, G. / Pätzold, J.: Grundfragen der Wirtschaftspolitik; 8. Auflage, Vahlen, 2012

_ Streit, M.: Theorie der Wirtschaftspolitik; 6. Auflage, Lucius & Lucius, 2005

Rechtliche Grundlagenliteratur

_ Bornhofen, M. / Bornhofen, M.C.: Steuerlehre 2 (Rechtslage 2012). Einkommensteuer, _ Bewertungsgesetz und Erbschaftsteuer, 33. Auflage, Gabler, 2013

_ Eisenmann, H. / Jautz, U.: Grundriss Gewerblicher Rechtsschutz und Urheberrecht, 9. Auflage, Müller 2012

_ Ilzhöfer, V. / Engels, R.: Patent-, Marken- und Urheberrecht, 8. Auflage, Vahlen, 2010

_ König Chr./ Schreiber K.: Europäisches Wettbewerbsrecht. Kartell- und Missbrauchsverbot, Fusionskontrolle, Beihilfen- und Vergaberecht. 1. Auflage, UTB, 2010

_ Ogorek, M. / Muckel, S.: Sozialrecht, 4. Auflage, Beck, 2011

_ Peters, H.-J.: Umweltrecht, 4. Auflage, Kohlhammer, 2010

_ Stober, R.: Allgemeines Wirtschaftsverwaltungsrecht. Grundlagen des deutschen, europäischen und internationalen öffentlichen Wirtschaftsrechts, 17. Auflage, Kohlhammer, 2011 [*updated 18.12.2018*]

Thesis

Module name (EN): Thesis
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMASc325
Hours per semester week / Teaching method: -
ECTS credits: 15
Semester: 3
Mandatory course: yes
Language of instruction: German
Assessment: Evaluation of the written Master´s thesis
Curricular relevance: WIMASc325 Industrial Engineering, Master, ASPO 01.10.2014, semester 3, mandatory course
Workload: The total student study time for this course is 450 hours.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Studienleitung
Lecturer: Studienleitung [*updated 16.02.2013*]

Learning outcomes:

_ After completing their thesis, students will be able to structure and work on a given topic from the field of industrial engineering independently within a given period of time in accordance with the methods of scientific work.

_ The Master´s thesis, which is supervised by university lecturers, allows students to demonstrate their ability to work on problems and tasks using the theoretical knowledge acquired during their studies and in accordance with the methods of scientific work, thus making them qualified for scientific work in professional practice.

_ Students will be able to research the available scientific findings and develop their own theoretical concepts and models.

_ The successful completion of their Master´s thesis formally entitles graduates to work on their PhD.

[*updated 18.12.2018*]

Module content:

The Master´s thesis is a written thesis. Students´ results will be presented and evaluated in a colloquium with regard to their problems and the solutions found (see corresponding module description).

As a rule, students are given a practical and application-oriented topic. Students then independently research the available scientific findings, carry out analyses and formulate their theses. In order to accomplish the objectives set in their Master´s thesis, students must conduct their own empirical/theoretical research. This allows them to develop their own theories and models, which they then verify or disprove according to scientific criteria.

The thesis topics are usually coordinated with the supervising lecturer(s) and stem from current research and development projects from the field of indutrial engineering at the htw saar. The subject of the thesis can also be selected and defined in cooperation with one or more university lecturers, companies or industrial enterprises.

[*updated 18.12.2018*]

Teaching methods/Media:

The media used will depend on the respective topic. In principle, the thesis must be submitted in multiple copies in paper form (see the examination regulations for details) and also in electronic form (e.g. CD, DVD; accepted electronic formats are PDF, Word document, OpenOffice document).

The basic rules of scientific work must be observed in the thesis.

[*updated 18.12.2018*]

Recommended or required reading:

Depends on the respective topic.

[*updated 18.12.2018*]

Industrial Engineering Master - optional courses

"Engineering Visions" and Intercultural Experience Intensive Program

Module name (EN): "Engineering Visions" and Intercultural Experience Intensive Program
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-Ing14
Hours per semester week / Teaching method: -
ECTS credits: 4
Semester: 3
Mandatory course: no
Language of instruction: English
Assessment: Project
Curricular relevance: WIMAScWPF-Ing14 Industrial Engineering, Master, ASPO 01.10.2014, semester 3, optional course, general subject
Workload: The total student study time for this course is 120 hours.
Recommended prerequisites (modules): WIMASc245 International Business Communication [*updated 11.02.2020*]
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Frank Kneip

Lecturer: Prof. Dr. Frank Kneip
[*updated 06.06.2018*]

Learning outcomes:
[*still undocumented*]

Module content:
[*still undocumented*]

Recommended or required reading:
[*still undocumented*]

Assembly Technology

Module name (EN): Assembly Technology
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-Ing13
Hours per semester week / Teaching method: 1V+1U (2 hours per week)
ECTS credits: 3
Semester: 1
Mandatory course: no
Language of instruction: German
Assessment: Written exam
Curricular relevance: WIMAScWPF-Ing13 Industrial Engineering, Master, ASPO 01.10.2014, semester 1, optional course, general subject
Workload: 30 class hours (= 22.5 clock hours) over a 15-week period. The total student study time is 90 hours (equivalent to 3 ECTS credits). There are therefore 67.5 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for: WIMAScWPF-W18 [*updated 11.02.2020*]
Module coordinator: Prof. Dr.-Ing. Christian Köhler

Lecturer:
Prof. Dr.-Ing. Christian Köhler
[*updated 06.01.2020*]

Learning outcomes:
After successfully completing this module students will:
- have sound knowledge of assembly-friendly product design
- be able to design, plan and evaluate assembly systems of varying complexity.
- possess sound knowledge about handling technology
- be familiar with current topics from the field of industrial assembly technology and assembly organization (e.g. Industry 4.0, collaborative robotics)
[*updated 18.12.2018*]

Module content:
1. Introduction
2. Assembly-friendly product design
3. Organizing, planning and evaluating assembly systems
4. Planning and designing manual assembly workstations
5. Planning and designing hybrid assembly systems
6. Planning and designing automatic assembly systems
7. Planning and designing flexible assembly systems with the use of robots
8. Material supply and handling technology
9. Current topics (Industry 4.0 and collaborative robotics)
[*updated 18.12.2018*]

Teaching methods/Media:
Lecture with integrated exercises
[*updated 18.12.2018*]

Recommended or required reading:
Lotter, B./Wiendahl, H.-P. (Hrsg.): Montage in der industriellen Produktion. 2. Auflage, SpringerVieweg VDI-Buch, 2013
Wiendahl, H.-P.: Betriebsorganisation für Ingenieure. 8. Auflage, Hanser, 2014
Westkämper, E./Bullinger, H.-J./Horváth, P./Zahn, E.: Montageplanung _ effizient und marktgerecht. Springer VDI-Buch, 2001
Eversheim, W.: Organisation in der Produktionstechnik _ Band 4: Fertigung und Montage. 2. Auflage, VDI-Verlag, 1989
Hesse, S.: Grundlagen der Handhabungstechnik. 4. Auflage, Hanser, 2016
Feldhusen, J./Grote: K.-H.: Pahl/Beiz _ Konstruktionslehre. 7. & 8. Auflage, Springer Vieweg
[*updated 18.12.2018*]

Company Succession in Practice

Module name (EN): Company Succession in Practice
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-W7
Hours per semester week / Teaching method: 1V+1PA (2 hours per week)
ECTS credits: 3
Semester: 2
Mandatory course: no
Language of instruction: German
Assessment: Project
Curricular relevance: WIMAScWPF-W7 Industrial Engineering, Master, ASPO 01.10.2014, semester 2, optional course, general subject
Workload: 30 class hours (= 22.5 clock hours) over a 15-week period. The total student study time is 90 hours (equivalent to 3 ECTS credits). There are therefore 67.5 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Andy Junker

Lecturer:
Prof. Dr. Andy Junker
[*updated 20.01.2020*]

Learning outcomes:
After successfully completing this module, students will be familiar with the business, technical and operational aspects of business value enhancement and be able to implement these methods. They will be introduced to "company succession" as a special form of a "business start-up" and learn about measures that enhance the value of a business.
In case studies, students will work on practical problems, find solutions to them and present their results to the group.
In a final presentation - preferably in cooperation with our partner SIKB - selected results will be presented and, ideally, direct contact established to potential company transferors.
[*updated 18.12.2018*]

Module content:
1. Current situation of company succession in Germany
2. Business management methods for business value enhancement
2.1. Working capital management
2.2. Business valuation in medium-sized companies
2.3. Due diligence in company succession
3. Technical and interdisciplinary methods of business value enhancement
4. The "phase model" of company succession
[*updated 18.12.2018*]

Teaching methods/Media:
Lecture with case studies
[*updated 18.12.2018*]

Recommended or required reading:
Coenenberg/Salfeld: Wertorientierte Unternehmensführung, latest edition.
Junker/Griebsch: Unternehmensnachfolge und Unternehmenswertsteigerung
IfM Bonn: various studies
[*updated 18.12.2018*]

Computational Fluid Dynamics (CFD)

Module name (EN): Computational Fluid Dynamics (CFD)
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-Ing12
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 6
Semester: 3
Mandatory course: no
Language of instruction: English
Assessment: Written or oral exam
Curricular relevance: MAM.2.1.2.28 Engineering and Management, Master, ASPO 01.10.2013, optional course, specialisation WIMAScWPF-Ing12 Industrial Engineering, Master, ASPO 01.10.2014, semester 3, optional course, general subject
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): WIMASc245 International Business Communication [*updated 11.02.2020*]
Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Frank Ulrich Rückert

Lecturer:
Prof. Dr. Frank Ulrich Rückert
[*updated 11.02.2020*]

Learning outcomes:
COMPUTATIONAL FLUID DYNAMICS
==========
Computational Fluid Dynamics (CFD) is used to develop, e.g. wind mills, airplanes or ships. Mastery of the English language is necessary for managing engineering projects in cooperation with different international partners.

ENGLISH LANGUAGE
==========
Students will have the opportunity to practice working in business projects. All lessons will be held in English.

AFTER SUCCESSFULLY COMPLETING THIS MODULE, STUDENTS WILL:
==========
- be familiar with the basics of classic fluid dynamics and can independently solve problems related to fluid dynamics
- have learned how to work on technical problems involving for example, airplanes, wing profiles, windmills and water channels
- have learned the basics of the commercial computational fluid dynamics (CFD) code ANSYS Workbench (CFX) and the open-source CFD code OpenFOAM. This includes creating geometries, problem setup, as well as using numerical simulation
- be able to estimate the costs and benefits of fluid flow simulations and can present further results

[*updated 18.12.2018*]

Module content:
Content:
========
Introduction to computational fluid dynamics (CFD)
_ Why open-source? Why commercial products?
- Teams will be formed to develop an airplane
- Crash course on ANSYS Workbench (CFX) and openFOAM

Computational fluid dynamics and theory:
- generating numerical meshes for industrial cases

The basic conservation equations
- conservation of mass
- conservation of momentum
- two equation turbulence models
- conservation of energy

Discretization and numerical simulation
- philosophy and aim of computational fluid dynamics (CFD)
- What do pre-processing, solving and post-processing mean?
- parametric geometry and mesh types
- numerical simulation of flow problems
- visualization of fluid flow problems with post-processing
- validation of experimental results against simulation

Turbulence and numerical diffusion
[*updated 18.12.2018*]

Teaching methods/Media:
Methods and media:
- theory lessons by the teacher
- guided computer exercises with ANSYS Workbench (CFX) and OpenFOAM
- setup of simulation problems and presentation of results in front of audience
[*updated 18.12.2018*]

Recommended or required reading:
- Cengel, Yunus A.; Cimbala, John M.: "Fluid Mechanics Fundamentals and Applications"; Mc Graw Hill; Higher Education; 2010
- Peric, M., Ferziger, J. H.: "Computational Methods for Fluid Dynamics"; Springer-Verlag; 2004
- Rückert, Frank U.: "A short introduction to CFD" (english language); htw saar; 2017
[*updated 18.12.2018*]

Energy Trading in Practice

Module name (EN): Energy Trading in Practice
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-W15
Hours per semester week / Teaching method: -
ECTS credits: 3
Semester: according to optional course list
Mandatory course: no
Language of instruction: German
Assessment: Written exam
Curricular relevance: WIMAScWPF-W15 Industrial Engineering, Master, ASPO 01.10.2014, optional course, general subject
Workload: The total student study time for this course is 90 hours.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Uwe Leprich
Lecturer: Prof. Dr. Uwe Leprich [*updated 28.09.2015*]

Learning outcomes:
The objective of this module is to impart practice-relevant specialist knowledge about trading on the European Energy Exchange (EEX) in Leipzig.
[*updated 18.12.2018*]

Module content:
The lecture is directly linked to the practice-relevant content of the EEX.

This includes: principles of stock exchange trading, contract specifications, market making, order book trading, trade registration, protection mechanisms, definition and determination of settlement prices, trade and position management, risk management, comparison of the advantages and disadvantages of the use of futures and options, portfolio management with futures and options (hedging). In addition, a trading platform course will be conducted on the following topics: system registration and setup, order book overview and depth, order mask and order management, executed trades, system messages and other system functions.
[*updated 18.12.2018*]

Recommended or required reading:
Relevant literature will be announced and discussed in the lecture.
[*updated 18.12.2018*]

Factory and Logistics Planning

Module name (EN): Factory and Logistics Planning
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-Ing3
Hours per semester week / Teaching method: 2V (2 hours per week)
ECTS credits: 3
Semester: 1
Mandatory course: no
Language of instruction: German
Assessment: Written exam
Curricular relevance: WIMAScWPF-Ing3 Industrial Engineering, Master, ASPO 01.10.2014, semester 1, optional course
Workload: 30 class hours (= 22.5 clock hours) over a 15-week period. The total student study time is 90 hours (equivalent to 3 ECTS credits). There are therefore 67.5 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Prof. Wilhelm Hauser

Lecturer:
Lehrbeauftragte
[*updated 05.02.2020*]

Learning outcomes:
After successfully completing this course, students will be familiar with the essential influencing factors of logistics-compatible factory planning. They will be able to determine location criteria (including international criteria) and process it in a systematic location selection, design logistics processes and key figures for factory planning and, based on this, create qualified space requirement and cost estimates. They will be familiar with the current procedures in the construction planning and tendering phases of factory buildings and will be able to carry out negotiation and contract award procedures. Students will be able to perform dimensioning tasks for factory buildings and logistics and carry out logistic bottleneck analyses with computer-aided simulation systems. They will be proficient managing and monitoring delivery times for structural and technical facilities and their commissioning and acceptance.
[*updated 18.12.2018*]

Module content:
1. Location analysis (location selection, key logistics figures, cost estimation)
2. (International) factory planning (construction planning, tendering, negotiating offers, awarding contracts)
3. Simulation (dimensioning tasks, logistic bottleneck analysis, mapping of overall process)
4. Realization (monitoring delivery times, assembly control, commissioning, acceptance)
5. Increasing efficiency (systematic production and logistics analysis)

[*updated 18.12.2018*]

Teaching methods/Media:
Projector-presentation, case studies, lecture notes
[*updated 18.12.2018*]

Recommended or required reading:

_ Arnold, D.: Materialfluß in Logistiksystemen, Springer 2002
_ Fischer/Dittrich: Materialfluß und Logistik; Springer 2003
_ Grundig, C.: Fabrikplanung, Hanser 2006
_ Koether, R.: Technische Logistik, Hanser 2006
_ IFF (Hrsg.): Gestaltung der Fabrikplanung als industrielle Dienstleistung, IRB Verlag; 2004
_ Schönheit, Martin: Fabrik und Mensch; Hanser 2006

[*updated 18.12.2018*]

Financial Management

Module name (EN): Financial Management
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-W10
Hours per semester week / Teaching method: 4V (4 hours per week)
ECTS credits: 6
Semester: 3
Mandatory course: no
Language of instruction: English
Assessment: Written exam (120 minutes / can be repeated semesterly)
Curricular relevance: MAIM-231 International Management, Master, ASPO 01.10.2012, semester 2, mandatory course MAIM-231 International Management, Master, ASPO 01.10.2016, semester 2, mandatory course MAIM-231 International Management, Master, ASPO 01.10.2020, semester 2, mandatory course WIMAScWPF-W10 Industrial Engineering, Master, ASPO 01.10.2014, semester 3, optional course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): WIMASc245 International Business Communication [*updated 11.02.2020*]
Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Matthias Gröhl

Lecturer:
Prof. Dr. Matthias Gröhl
Prof. Dr. Mana Mojadadr
[*updated 11.02.2020*]

Learning outcomes:
Corporate Finance:
After successfully completing this module, students will be able to establish the link between financial management objectives and a company´s position in the capital markets based on their knowledge of corporate finance and investment. They will understand the basic shareholder value concept and the associated value drivers of a company.
Students will be able to prepare their own cash flow statements and develop a company´s financial and liquidity planning. Whereby they will be able to distinguish between long-term and short-term financial planning.
Students will be familiar with the concept and forms of informational efficiency on capital markets. They will also be able to explain and differentiate the theoretical models for determining risk and return. In particular, they will have learned the concept of the portfolio theory and the resulting model for determining equity capital costs (CAPM).
With the EVA concept, the students will become familiar with an essential concept in the context of value-oriented corporate management. Students will be able to model and explain the theories on optimal capital structure and dividend policy.
Finally, students will be able to distinguish and apply the basic procedures of business valuation. In addition, they will have learned the basics of mergers and acquisitions.

Financial Risk Management:
After successfully completing this module, students will be able to interpret the general concept of risk and distinguish it from the concept of financial risk. In addition, they will be able to map the risk management process.
Students will be able to:
- present and evaluate the different types of stock options and assess their applicability,
- describe and evaluate interest rate futures (long and short) and assess their applicability,
- describe FX forwards with regard to the essential influencing factors and calculate them in real cases,
- explain interest rate swaps and currency swaps with regard to their structure and areas of application, and calculate them in specific cases,
- explain interest rate limit contracts with regard to their structure and areas of application, and calculate them specific cases.
[*updated 06.12.2019*]

Module content:

1 Introduction to Corporate Finance
2 Financial Planning
3 Understanding Risk and Return
4 Cost of Capital and Capital Structure
5 Valuation of a Company
6 Mergers and Acquisitions

Financial Risk Management:
Chapter 1: Introduction
1.1 Risk
1.2 Market Price Risks
1.3 Credit Risk
1.4 Liquidity Risk
1.5 Fundamentals of Financial Risk Management
Chapter 2: Options
Chapter 3: Futures
Chapter 4: Currency Exchange Hedging
Chapter 5: Swap Agreements
Chapter 6: Interest Rate Agreements
6.1 Interest Rate Caps
6.2 Interest Rate Floors
6.3 Interest Rate Collars
6.4 Forward Rate Agreements
[*updated 18.12.2018*]

Teaching methods/Media:
Lecture with case studies, exercises and research work
[*updated 18.12.2018*]

Recommended or required reading:
Corporate Finance:
Berens, W.: Due Diligence bei Unternehmensakquisitionen, akt. Aufl., Stuttgart.
Brealey, R. A./Myers, S. C.: Principles of Corporate Finance, latest edition, New York.
Bruner, R. F./Eades, K. M./Schill, M. J.: Case Studies in Finance: Managing for Corporate Value Creation, latest edition, Boston.
Damodaran, A.: Applied Corporate Finance, latest edition, Hoboken.
Ernst, D.: Applied International Corporate Finance, latest edition, München.
Hommel, M./Dehmel, I.: Unternehmensbewertung Case by Case, latest edition, Frankfurt.
Müller-Stewens, G./Kunisch, S./Binder, A.: Mergers & Acquisitions: Analysen, Trends und Best Practices, Stuttgart 2010.
Ross, S. A./Westerfield, R./Jaffe, J., Modern Financial Management, latest edition, Boston.

Financial Risk Management:
Albrecht, P. / Maurer, R.: Investment- und Risikomanagement, latest edition, Schaeffer-Poeschel, Stuttgart.
Allen, S: Financial Risk Management, John Wiley & Sons, latest edition, New Jersey.
Bloss, M. / Ernst, D.: Derivate, latest edition, München und Wien.
Bösch, M.: Derivate, München 2011.
Eilenberger, G.: Währungsrisiken, Währungsmanagement und Devisenkurssicherung von Unternehmungen, latest edition, Frankfurt a.M..
Eller, R.(Hrsg.): Handbuch derivativer Instrumente, latest edition, Stuttgart.
Geyer, C. / Uttner, V.: Praxishandbuch Börsentermingeschäfte, latest edition, Wiesbaden.
Heidorn, T.: Finanzmathematik in der Bankpraxis, latest edition, Wiesbaden.
Hull, J. C.: Options, Futures and other Derivatives, latest edition, New Jersey.
Kruse, S.: Aktien-, Zins- und Währungsderivate, latest edition, Springer Gabler, Wiesbaden.
Staroßom, H.: Corporate Finance Teil 1: Grundlagen, Zins- und Währungsmanagement, latest edition, Springer Gabler, Wiesbaden.
Uszczapowski, I. / Müller, H.G.: Optionen und Futures verstehen, latest edition, München.
[*updated 29.11.2019*]

Free-Choice Elective for Double-Degree-Program Students

Module name (EN): Free-Choice Elective for Double-Degree-Program Students
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-FÜ6
Hours per semester week / Teaching method: -
ECTS credits: 4
Semester: 2
Mandatory course: no
Language of instruction: German
Assessment: Accreditation of prior learning
Curricular relevance: WIMAScWPF-FÜ6 Industrial Engineering, Master, ASPO 01.10.2014, semester 2, optional course, general subject
Workload: The total student study time for this course is 120 hours.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Studienleitung
Lecturer: Studienleitung [*updated 05.09.2016*]

Learning outcomes: [*still undocumented*]
Module content: [*still undocumented*]
Recommended or required reading: [*still undocumented*]

Heat and Mass Transfer

Module name (EN): Heat and Mass Transfer
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-Ing11
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 6
Semester: 2
Mandatory course: no
Language of instruction: German
Assessment: Written exam
Curricular relevance: WIMAScWPF-Ing11 Industrial Engineering, Master, ASPO 01.10.2014, semester 2, optional course, general subject
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Frank Ulrich Rückert

Lecturer:
Prof. Dr. Frank Ulrich Rückert
[*updated 20.01.2020*]

Learning outcomes:
After successfully completing this module students will:
_ be familiar with the three transfer mechanisms: thermal convection, thermal conduction and thermal radiation and be able to independently classify and formulate simple problems.
_ understand the influence of boiling, condensation and cavitation phenomena on heat transfer.
_ be familiar with the comparative figures and be able to apply them.
_ be able to create simple application cases from the field with the AMESim tool, interpret the results and present and discuss them to the group (presentation with PowerPoint).
Lastly, students will have received a first insight into modelling complex heat transfer problems on metallic components with the ANSYS tool.
[*updated 18.12.2018*]

Module content:
The lecture will deal with the basic theory of heat and mass transfer. It will be supplemented by arithmetical exercises that will be calculated in class on the blackboard (exam preparation). In addition to the theoretical arithmetical tasks, problems from everyday "technical" life will be discussed, e.g.:
_ Heat conduction in different metals
_ The arrangement of radiators in an apartment room
_ Yield/influence weather on solar collectors
_ The optimization of shell and tube heat exchangers
_ Heat balance in vehicle cockpits
The user-friendly tools AMESim and ANSYS will be introduced and students will be able to practice using them. (Easy handling; previous knowledge is not necessary.)
The resulting technical solutions, as well as possible design alternatives, will be discussed in the group.
[*updated 18.12.2018*]

Teaching methods/Media:
Presentation/lecture with projector, calculations on the blackboard
Supervised computer exercises in the pool; student presentation of solutions (creation of a PowerPoint presentation)
[*updated 18.12.2018*]

Recommended or required reading:
_ _Lecture notes - Wärme- und Stoffübertragung_; F. U. Rückert, 2016
_ _Heat and Mass Transfer _ Fundamentals & Applications 5e (SI Units)_; Y. A. Cengel, A. J. Ghajar, 2016
[*updated 18.12.2018*]

IT Project 1

Module name (EN): IT Project 1
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-Ing1
Hours per semester week / Teaching method: 2PA (2 hours per week)
ECTS credits: 3
Semester: 2
Mandatory course: no
Language of instruction: German
Assessment: Graded project work
Curricular relevance: WIMAScWPF-Ing1 Industrial Engineering, Master, ASPO 01.10.2014, semester 2, optional course
Workload: 30 class hours (= 22.5 clock hours) over a 15-week period. The total student study time is 90 hours (equivalent to 3 ECTS credits). There are therefore 67.5 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): WIMASc125 Statistical Methods Put into Practice / Information and Communication Technology [*updated 05.02.2020*]
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Daniel F. Abawi

Lecturer:
Prof. Dr. Daniel F. Abawi
[*updated 05.02.2020*]

Learning outcomes:
After successfully completing this module students will:
_ be able to independently provide solutions for computer science tasks
be proficient in the object-oriented language Java, as well as UML for modelling and implementing a business scenario
[*updated 18.12.2018*]

Module content:
1. Using class libraries
2. Design of class structures
3. Structured program design
4. Elements of software engineering
5. Documentation and tools for teamwork
6. Case study and project

[*updated 18.12.2018*]

Teaching methods/Media:
Projector, slides (lecture notes), independent and guided exercises. Only open source software will be used.
[*updated 18.12.2018*]

Recommended or required reading:
_ Ullenboom, Christian: Java ist auch eine Insel, 10. Auflage, Galileo OpenBook 2011
_ Herold, H.; Lurz, B.; Wohlrab, J.: Grundlagen der Informatik, Pearson Studium Verlag, 2011

Further recommendations regarding literature or for example, web articles will be made by the lecturer in the course.
[*updated 18.12.2018*]

IT Projects 1+2

Module name (EN): IT Projects 1+2
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-Ing8
Hours per semester week / Teaching method: 4PA (4 hours per week)
ECTS credits: 6
Semester: 2
Mandatory course: no
Language of instruction: German
Assessment: Presentation
Curricular relevance: WIMAScWPF-Ing8 Industrial Engineering, Master, ASPO 01.10.2014, semester 2, optional course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): WIMASc125 Statistical Methods Put into Practice / Information and Communication Technology [*updated 05.02.2020*]
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Daniel F. Abawi

Lecturer:
Prof. Dr. Daniel F. Abawi
[*updated 05.02.2020*]

Learning outcomes:
After successfully completing this module students will:
_ be able to independently provide solutions for computer science tasks
be proficient in the object-oriented language Java, as well as UML for modelling and implementing a business scenario
[*updated 18.12.2018*]

Module content:
1. Requirements analysis and concept
2. Using class libraries
3. Design of class structures
4. Structured program design
5. Elements of software engineering
6. Documentation and tools for teamwork
7. Case study and project

[*updated 18.12.2018*]

Teaching methods/Media:
Projector, slides (lecture notes), independent and guided exercises. Only open source software will be used.
[*updated 18.12.2018*]

Recommended or required reading:
_ Ullenboom, Christian: Java ist auch eine Insel, 10. Auflage, Galileo OpenBook 2011
_ Herold, H.; Lurz, B.; Wohlrab, J.: Grundlagen der Informatik, Pearson Studium Verlag, 2011

Further recommendations regarding literature or for example, web articles will be made by the lecturer in the course.
[*updated 18.12.2018*]

Industry 4.0: Principles & Implementation

Module name (EN): Industry 4.0: Principles & Implementation
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-W16
Hours per semester week / Teaching method: 1V+1U (2 hours per week)
ECTS credits: 3
Semester: 2
Mandatory course: no
Language of instruction: German
Assessment: Written exam or written composition
Curricular relevance: WIMAScWPF-W16 Industrial Engineering, Master, ASPO 01.10.2014, semester 2, optional course, general subject
Workload: 30 class hours (= 22.5 clock hours) over a 15-week period. The total student study time is 90 hours (equivalent to 3 ECTS credits). There are therefore 67.5 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): WIMASc145 Manufacturing Technologies WIMAScWPF-W6 Operations Management [*updated 11.02.2020*]
Recommended as prerequisite for:
Module coordinator: Prof. Dr.-Ing. Christian Köhler

Lecturer:
Lehrbeauftragte
[*updated 11.02.2020*]

Learning outcomes:
After successfully completing this module, students will _
... be familiar with the origins, range and current status of Industry 4.0
_ be familiar with the current challenges, constraints and requirements of Industry 4.0.
_ be familiar with the initial implementation of Industry 4.0, but also with the existing limits of implementation in production plants.
... understand the relevance of technology, organization and employees in implementing Industry 4.0.
_ will be familiar with strategies and process models for implementing Industry 4.0 in manufacturing companies and will be able to implement these operationally.
_ be familiar with existing concepts in today´s research for implementing Industry 4.0, especially in SMEs, amidst very limited resources.
_ be familiar with strategies and process models, especially with regard to the involvement of social partners, in the development and design of I 4.0 implementations
_ be aware of current Industry 4.0 implementation, especially with regard to the possibilities/benefits and limits of assistance systems in manufacturing companies.
[*updated 18.12.2018*]

Module content:

- Industry 4.0 - The Basics
- I 4.0 principles, significance, organizational design principles
- I 4.0 challenges for enterprises (SMEs/NSMEs)
- I 4.0 and new business models (hybrid value creation)
- Visions of tomorrow´s factory: chances and risks
- Adaptability and Industry 4.0
- I 4.0 interactions between technology/organization/employees
- Co-determination aspects: involving social partners
- Changes in work and leadership
- Qualification and employee development under I4.0
- Excerpts from the current status of I4.0 research projects

Operational implementation of Industry 4.0 in companies:
- Process model for introducing Industry 4.0
- Economic evaluations during the introduction of I 4.0
- Lean methods and adaptability as a basis for introducing I4.0
- Procedures for involving social partners (involvement and regulations)
- I 4.0 in practice: context-sensitive, intelligently adaptive assistance and knowledge services
- I 4.0 in practice: synchronous production through semi-autonomous planning and human-centric decision support
[*updated 18.12.2018*]

Teaching methods/Media:
Projector-presentation, blackboard, lecture notes, case studies, discussions, group work
[*updated 18.12.2018*]

Recommended or required reading:
1.
Praxishandbuch Industrie 4.0: Branchen - Unternehmen - M & A
Lucks, Kai. - 1. Auflage 2017. - Stuttgart: Schäffer-Poeschel, 2017

2.
Industrie 4.0 konkret: Ein Wegweiser in die Praxis [electronic resource]
/ Jahn, Myriam. - Wiesbaden: Springer Gabler, 2017
DOI-Link: 10.1007/978-3-658-17770-6

3.
Klein(st)- und Mittelbetriebe im Kontext zu Industrie 4.0: die neue Entwicklung der Wirtschaft
Kettl, Alexander. - Saarbrücken: AV Akademikerverlag, [2017] [Hochschulschrift]

7.
Handbuch Industrie 4.0: Geschäftsmodelle, Prozesse, Technik
Reinhart, Gunther [HerausgeberIn]. - München: Hanser, [2017]

8.
Handbuch Industrie 4.0
Vogel-Heuser, Birgit [HerausgeberIn]; Bauernhansl, Thomas [HerausgeberIn]; Ten Hompel, Michael [HerausgeberIn]. - Berlin; [Heidelberg]: Springer Vieweg

9.
Integrierte Unternehmensplanung: Anforderungen, Lösungen und Echtzeitsimulation im Rahmen von Industrie 4.0
Mosler, Andreas. - Wiesbaden: Springer Gabler, [2017]

10. Die digitale Transformation gestalten
acatech [HerausgeberIn]. - München: Hanser, [2017]

11. Wandlungsfähigkeit durch modulare Produktionssysteme
Kreimeier, Dieter [HerausgeberIn]. _Herrmann, Klaus [HerausgeberIn]. _ Frakfurt a.M.: VDMA Verlag, [2013]
[*updated 18.12.2018*]

Market and Business Processes in the Energy Transition

Module name (EN): Market and Business Processes in the Energy Transition
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-FÜ4
Hours per semester week / Teaching method: 2V (2 hours per week)
ECTS credits: 3
Semester: according to optional course list
Mandatory course: no
Language of instruction: German
Assessment: Written exam und presentation (60 Minuten; Weighting 70% resp. 30%)
Curricular relevance: WIMAScWPF-FÜ4 Industrial Engineering, Master, ASPO 01.10.2014, optional course
Workload: 30 class hours (= 22.5 clock hours) over a 15-week period. The total student study time is 90 hours (equivalent to 3 ECTS credits). There are therefore 67.5 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Uwe Leprich

Lecturer:
Lehrbeauftragte
[*updated 06.01.2020*]

Learning outcomes:
After successfully completing this module, students will have in-depth knowledge about the market and business processes of the German energy sector. They will be able to place key transformation developments and problems of the energy transition in an overall context and critically analyze and evaluate them.
[*updated 18.12.2018*]

Module content:
The energy industry is facing an epochal change due to the energy transition. As an infrastructure industry where the market players are strongly interdependent as a result of the grid-related interchange, input from numerous fields of science and technology will be necessary in order to cope with the system transformation. Based on experience from the field of change management in the energy industry, we will discuss methods and processes from the areas of networks and trading, as well as the energy regulatory framework. On the basis of this knowledge, we will analyze and discuss current developments (smart grid/ virtual power plants etc.).

[*updated 18.12.2018*]

Teaching methods/Media:
A detailed outline with references and a set of slides will be provided for this module. In addition to the lecture, students will analyze current articles, as well as television, radio and Internet contributions.
[*updated 18.12.2018*]

Recommended or required reading:
Depends on current developments.
[*updated 18.12.2018*]

Operations Management

Module name (EN): Operations Management
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-W6
Hours per semester week / Teaching method: 1V+1U (2 hours per week)
ECTS credits: 3
Semester: 1
Mandatory course: no
Language of instruction: German
Assessment:
Curricular relevance: WIMAScWPF-W6 Industrial Engineering, Master, ASPO 01.10.2014, semester 1, optional course
Workload: 30 class hours (= 22.5 clock hours) over a 15-week period. The total student study time is 90 hours (equivalent to 3 ECTS credits). There are therefore 67.5 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for: WIMASc215 Quality Management / Cost Management WIMAScWPF-W16 Industry 4.0: Principles & Implementation WIMAScWPF-W18 [*updated 11.02.2020*]
Module coordinator: Prof. Dr.-Ing. Christian Köhler

Lecturer:
Prof. Dr.-Ing. Christian Köhler
[*updated 11.02.2020*]

Learning outcomes:
After successfully completing this module, students will _
_ be familiar with the current challenges, constraints, requirements and tasks in operations management.
_ be familiar with existing organizational forms for production plants and be able to determine suitable organizational forms in accordance with given circumstances.
_ be able to derive a production strategy, implement it operationally and monitor it using a suitable key performance indicator system.
_ be familiar with existing concepts for the management of material flows, information flows, equipment and manpower and will be able to apply them to examples.
_ be familiar with strategies for integrating new products, as well as changing and discontinuing existing ones.
_ be familiar with selected strategies for optimizing a production area.
[*updated 18.12.2018*]

Module content:
Strategic Aspects of Operations Management
- Introduction to, requirements, framework conditions and current challenges of operations management
- Management and leadership in the production environment
- Strategy development and implementation
- KPI systems for production
- Elements of production systems
- Organizational forms of production plants

Planning and Operational Aspects of Production Management
- Material flow management
- Information flow management
- Production equipment management
- Human resources and labor management
- New products, change & discontinuation management
- Improvement management
[*updated 18.12.2018*]

Teaching methods/Media:
Projector-presentation, blackboard, lecture notes, case studies, discussions, group work
[*updated 18.12.2018*]

Recommended or required reading:
R. Vahrenkamp: Produktionsmanagement. 6. Auflage, Oldenburg Verlag, München, 2008
G. Fandel, A. Fistek, S. Stütz: Produktionsmanagement. 2. Auflage, Springer, Berlin/Heidelberg, 2011
S. Kiemer, N. Maier-Scheubeck, R. Obermaier, M. Weiß: Produktionsmanagement, 9. Auflage, Oldenburg Verlag, München, 2009
H.-P. Wiendahl: Betriebsorganisation für Ingenieure. 8. Auflage, Carl Hanser Verlag, München, 2014
H.-O. Günther, H. Tempelmeier: Produktion und Logistik. 6. Auflage, Springer, Berlin/Heidelberg, 2005
G. Hachtel, U. Holzbaur: Management für Ingenieure in Produktion und Logistik. Vieweg+Teubner, Wiesbaden, 2010
[*updated 18.12.2018*]

Simulating Forming Processes with an FEM Project

Module name (EN): Simulating Forming Processes with an FEM Project
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-Ing10
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 6
Semester: according to optional course list
Mandatory course: no
Language of instruction: German
Assessment: Oral examination
Curricular relevance: WIMAScWPF-Ing10 Industrial Engineering, Master, ASPO 01.10.2014, optional course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Prof. Dr.-Ing. Dieter Arendes

Lecturer:
Prof. Dr.-Ing. Dieter Arendes
[*updated 20.01.2020*]

Learning outcomes:
After successfully completing this module students will:
_ will be familiar with the basic features of a selected FE software product and will be able to operate it in such a way that simple simulation tasks and FE projects can be carried out independently.
_ have acquired a basic understanding of the possibilities, requirements and limits of FE software, especially for simulating forming processes.
[*updated 18.12.2018*]

Module content:
1. Introduction to the FE simulation of forming processes
2. Basics of operating Simufact Forming
3. Introduction to the simulation of single and multi-stage cold extrusion processes
4. Introduction to the simulation of hot working processes
5. Simulation of selected forming processes (one for each student)
6. Implementation of a FEM project for the design or optimization of a forming process
[*updated 18.12.2018*]

Teaching methods/Media:
Projector presentation, independent and coached exercises in the PC lab, FE software
[*updated 18.12.2018*]

Recommended or required reading:
_ Operating instructions and training documents for the FE software "Simufact Forming" are an integral part of this course
_ Klein, B., FEM: Grundlagen und Anwendungen der Finite-Element-Methode im Maschinen- und Fahrzeugbau, Springer Vieweg, 9. Auflage, 2012
_ Doege, E.; Behrens B.-A., Handbuch Umformtechnik: Grundlagen, Technologien, Maschinen, Springer, 2. Auflage, 2010
_ König, W./ Klocke F.: Fertigungsverfahren, mehrere Bände, VDI-Verlag GmbH, Düsseldorf.
_ Lange, K.: Lehrbuch der Umformtechnik, mehrere Bände; 2. Auflage, Springer Verlag, 2002
_ Spur, G./ Stöferle, Th.: Handbuch der Fertigungstechnik, mehrere Bände, Karl-Hanser-Verlag.
[*updated 18.12.2018*]

Simulation in Production and Logistics

Module name (EN): Simulation in Production and Logistics
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-FÜ7
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 6
Semester: 3
Mandatory course: no
Language of instruction: German
Assessment: Term paper with presentation
Curricular relevance: MSCM-380 Supply Chain Management, Master, ASPO 01.10.2012, semester 3, optional course WIMAScWPF-FÜ7 Industrial Engineering, Master, ASPO 01.10.2014, semester 3, optional course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Thomas Bousonville

Lecturer: Prof. Dr. Thomas Bousonville
[*updated 04.07.2014*]

Learning outcomes:
After successfully completing this module students will be able to:
-- explain the possible applications of simulation for planning logistic systems,
-- independently map specific tasks from production and logistics in simulation models with the "Plant Simulation" simulation software,
-- validate and analyze the generated models and evaluate the results with regard to their task,
-- apply their acquired knowledge to more complex questions from operational practice.
[*updated 18.12.2018*]

Module content:
1. Introduction to simulation
2. Modeling and simulating material flows with "Plant Simulation"
2.1. Predefined components
2.2. Using the internal programming language SimTalk
3. Principles of stochastic simulation
4. Procedure model for conducting a simulation study
5. Case study on consumption-oriented material supply
[*updated 18.12.2018*]

Teaching methods/Media:
Lecture, exercises on the PC, group work, presentation
[*updated 18.12.2018*]

Recommended or required reading:
- Bangsow, S.: Fertigungssimulationen mit Plant Simulation und SimTalk, München 2008
- Rabe, M., Spiekermann, S., Wenzel, S.: Verifikation und Validierung für die Simulation in Produktion und Logistik, Berlin-Heidelberg 2008
- Wenzel, S., Weiß, M., Collisi-Böhmer, S., Pitsch H., Rose, O.: Qualitätskriterien für die Simulation in Produktion und Logistik, Berlin Heidelberg 2008
- Kuhn, A., Rabe, M.: Simulation in Produktion und Logistik. Fallbeispielsammlung,
[*updated 18.12.2018*]

Strategic Management

Module name (EN): Strategic Management
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-W4
Hours per semester week / Teaching method: 1V+1PA (2 hours per week)
ECTS credits: 3
Semester: 1
Mandatory course: no
Language of instruction: German
Assessment: Written exam or project work
Curricular relevance: WIMAScWPF-W4 Industrial Engineering, Master, ASPO 01.10.2014, semester 1, optional course
Workload: 30 class hours (= 22.5 clock hours) over a 15-week period. The total student study time is 90 hours (equivalent to 3 ECTS credits). There are therefore 67.5 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Malte Beinhauer

Lecturer:
Prof. Dr. Malte Beinhauer
[*updated 11.02.2020*]

Learning outcomes:
After successfully completing this course, students will recognize the increasing importance of strategic decisions in increasingly global markets. In addition, they will have an overview of the concepts of strategic management. Students will be proficient in using the instruments for carrying out a strategic analysis (strategy and target formulation, environment analysis, competitive analysis, determination of core competencies...). They will be able to formulate strategic alternatives and systematically select the appropriate one for their situation. Students will be familiar with implementation methods and can implement them according to the business area and company level.
[*updated 18.12.2018*]

Module content:
1. - Terms and concepts in strategic management
2. - Business environment analysis
3. - Corporate analysis
4. - Formulating a strategy
5. - Implementing a strategy
6. - Strategic challenges of multinational companies

[*updated 18.12.2018*]

Teaching methods/Media:
Projector-presentation, transparencies, lecture notes
[*updated 18.12.2018*]

Recommended or required reading:
Harrison/Joffrey: Strategic Management; Wiley 2007
Hitt/Ireland/Hoskisson: Strategic Management; 7. Ed.; South Western College Pub. 2006
Müller-Stewens: Strategisches Management, Schäffer-Poeschel 2005
Porter M.E.: Wettbewerbsvorteile, Spitzenleistungen erreichen und behaupten, Campus 2000
Saloner/Shepard/Podolny: Strategic Management; Rev. Ed. Wilney 2005
Steinmann/Schteyögg: Management, 5. Auflage, Gabler 2005
Wheelen/Hunger: Strategic Management and Business Policy; 10 Ed.; Prentice Hall; 2005
[*updated 18.12.2018*]

Technical Project

Module name (EN): Technical Project
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-Ing2
Hours per semester week / Teaching method: 4PA (4 hours per week)
ECTS credits: 6
Semester: 2
Mandatory course: no
Language of instruction: German
Assessment: Project
Curricular relevance: WIMAScWPF-Ing2 Industrial Engineering, Master, ASPO 01.10.2014, semester 2, optional course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Dirk Hübner

Lecturer:
Prof. Dr. Dirk Hübner
[*updated 06.01.2020*]

Learning outcomes:
After successfully completing this module, students will be familiar with the newest technical developments from research and development and will be able to work on and hold a presentation on engineering problems in this area.
[*updated 18.12.2018*]

Module content:
This course will be offered on various topics. In self-study, relevant practical or theoretical technical questions will be dealt with by the students under the close supervision of a professor of the HTW. Students can work in groups or alone. The project can involve one or more current technical issues from and in cooperation with a partner from the industry or topics from the htw, e.g. from ongoing research.

[*updated 18.12.2018*]

Teaching methods/Media:
The teaching methods and media depend on the respective topic/task.
[*updated 18.12.2018*]

Recommended or required reading:
Due to the variety of available topics/tasks, literature recommendations will be made after students select their resp. topics.
[*updated 18.12.2018*]

Transformation of the Federal German Electricity System (Parts 1 & 2))

Module name (EN): Transformation of the Federal German Electricity System (Parts 1 & 2))
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-W9
Hours per semester week / Teaching method: 3V+1U (4 hours per week)
ECTS credits: 6
Semester: 1
Mandatory course: no
Language of instruction: German
Assessment: Paper with presentation or written exam
Curricular relevance: WIMAScWPF-W9 Industrial Engineering, Master, ASPO 01.10.2014, semester 1, optional course, management
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Uwe Leprich

Lecturer:
Prof. Dr. Uwe Leprich (lecture)
[*updated 11.02.2020*]

Learning outcomes:
After successfully completing this module, students will have in-depth knowledge about the scope and characteristics of the transformation of the German electricity system. They will be able to place key transformation developments and problems in an overall context and critically analyze and evaluate them. In addition, they will be able to independently explore selected areas of transformation and present them in a structured form.
[*updated 18.12.2018*]

Module content:
1. Technical elements of the future electricity system
2. Institutional elements of the future electricity system
3. Financing elements
- Financing models for renewable energies
- Capacity mechanisms
- Financing system services
- Financing networks

4. The German electricity system in the European network
5. System expansions: electricity, heat, transport

[*updated 18.12.2018*]

Teaching methods/Media:
A detailed outline with references and a set of slides will be provided for this module.
[*updated 18.12.2018*]

Recommended or required reading:
_ Leprich, Uwe (2011): Systemtransformation statt Systemintegration: auf dem Weg zu einem zukunftsfähigen Stromsystem, in: Dietmar Schütz und Björn Klusmann (Hrsg.): Die Zukunft des Strommarktes, Ponte Press: Bochum, pp. 11-36.
_ IZES (2012): Kompassstudie Marktdesign - Leitideen für ein Design eines Stromsystems mit hohem Anteil fluktuierender Erneuerbarer Energien, Saarbrücken, November
_ Leprich, Uwe (2013): Green Paper on the further development of the European internal electricity market with renewable energy sources as the cornerstones of the future system, Februar, Saarbrücken
_ Growitsch, Christian/Matthes, Felix/Ziesing, H.-J. (Moderation) (2013): Clearing-Studie Kapazitätsmärkte im Auftrag des Bundesministeriums für Wirtschaft und Technologie (BMWi), Berlin/Köln, Mai 2013
_ IZES/BET/Bofinger (2013): Stromsystem-Design: Das EEG 2.0 und Eckpfeiler eines zukünftigen Regenerativwirtschaftsgesetzes, Saarbrücken/Aachen/Würzburg, Oktober
[*updated 18.12.2018*]

Web-Based Knowledge Management

Module name (EN): Web-Based Knowledge Management
Degree programme: Industrial Engineering, Master, ASPO 01.10.2014
Module code: WIMAScWPF-FÜ8
Hours per semester week / Teaching method: 4V (4 hours per week)
ECTS credits: 6
Semester: 3
Mandatory course: no
Language of instruction: German
Assessment: Project (creation of a website)
Curricular relevance: MAMS-520 Marketing Science, Master, ASPO 01.04.2016, optional course MARPF-520 Accounting and Finance, Master, ASPO 01.04.2016, optional course MASCM-520 Supply Chain Management, Master, ASPO 01.04.2016, optional course MASCM-520 Supply Chain Management, Master, ASPO 01.04.2017, optional course WIMAScWPF-FÜ8 Industrial Engineering, Master, ASPO 01.10.2014, semester 3, optional course, general subject
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 180 hours (equivalent to 6 ECTS credits). There are therefore 135 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Stefan Georg

Lecturer:
Prof. Dr. Stefan Georg
[*updated 20.01.2020*]

Learning outcomes:
After successfully completing this module, students will be able to describe the structure of a knowledge management system.
In addition, they will be able to name the design elements of knowledge management and put them into practice.
Students will be familiar with the tasks of a content management system for creating websites.
They will be able to actively use the content management system Joomla.
Students will be able to add templates, plug-ins and modules to Joomla and use the system to create a knowledge management-based website.
[*updated 13.09.2018*]

Module content:
1. Principles of Knowledge Management
1.1 Basic understanding of knowledge management
1.2 Introducing knowledge management in companies
1.3 Terms and basic concepts

2. Content Management Systems (CMS)
2.1 Principles of content management systems
2.2 The CMS "Joomla!"
2.3 Joomla! extensions

3. Planning a knowledge management-based website
3.1 Developing a suitable website theme
3.2 The basic structure of a website
3.3 Developing knowledge-based content
3.4 Implementing the website
[*updated 13.09.2018*]

Teaching methods/Media:
Course content will be conveyed in a lecture.
Group project work: lectures will be held regularly with individual group work outside the lecture and ongoing assistance/support for the project groups.
[*updated 13.09.2018*]

Recommended or required reading:

- Altmeyer, D./Georg, S.: Die Bedeutung von Wissensmanagement für Unternehmen, 1. Auflage 2002
- Hanke, J.K.: Content Management mit Joomla! 2.5 für Kids, 1. Auflage 2012
- Jardin, D.: Joomla! 2.5: Professionelle Webentwicklung, 1. Auflage 2012
- North, K.: Wissensorientierte Unternehmensführung: Wertschöpfung durch Wissen, 5. Auflage 2011
- Probst, J./Raub, S./Romhardt, K.: Wissen managen. Wie Unternehmen ihre wertvollste Ressource nutzbar machen,
  6. Auflage 2010
- Schüppel, J.: Wissensmanagement _ Organisatorisches Lernen im Spannungsfeld von Wissens- und Lernbarrieren,
  1. Auflage 1999

[*updated 13.09.2018*]