Course Handbook Industrial Engineering Bachelor

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Head of Studies	Prof. Dr. Daniel F. Abawi
Deputy Head of Studies	Prof. Dr. Frank Ulrich Rückert
Chairman of Examination	Prof. Dr. Dirk Hübner
Deputy Chairman of Examination	Prof. Dr. Rudolf Friedrich

Qualifikation Goals of Study Programme

Industrial Engineering Bachelor - mandatory courses (overview)

Module name (EN)	Code	SAP-P	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator
Business and Technical English	WIB21-510	P450-0282	5	2V+2U	5	Prof. Dr. Thomas Tinnefeld
Computer Science / Programming	WIB21-340	P450-0287	3	2V+2U	5	Prof. Dr. Daniel F. Abawi
Cost Accounting and the Basics of Management Accounting	WIB21-310	P450-0290	3	2V+2U	5	Prof. Dr. Stefan Georg
General Business Administration	WIB21-110	P450-0278	1	2V+2U	5	Prof. Dr. Stefan Georg
Moderation and Leadership / Communication	WIB21-610	P450-0293, P450-0294	6	2V+2U	5	Studienleitung
Private Commercial Law	WIB21-420	P450-0308	4	2V+2U	5	Prof. Dr. Esther Bollhöfer
Programming Project	WIB21-440	P450-0300	4	1V+3PA	5	Prof. Dr. Daniel F. Abawi
Technical Mechanics 1	WIB21-250	P450-0303	2	2V+2U	5	Prof. Dr. Frank Ulrich Rückert

Module name (EN)	Code	SAP-P	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator
Technical Mechanics 2	WIB21-350	P450-0304	3	2V+2U	5	Prof. Dr. Frank Ulrich Rückert

(9 modules)

Industrial Engineering Bachelor - optional courses (overview)

Module name (EN)	Code	SAP-P	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator
Automation Technology	WIB21-WPM-I-704	P450-0007	5	2V+2PA	5	Prof. Dr. Frank Kneip
Business Planning (Seminar)	WIB21-WPM-W-402	P450-0015	6	2SU+2S	5	Prof. Dr. Stefan Georg
Complementary Basics of Engineering	WIB21-WPM-T-100	P450-0017	5	2SU+2S	5	Alexander Hamman, M.Sc.
Consulting (Seminar, English)	WIB21-WPM-W-401	P450-0018	6	1SU+1S	3	Prof. Dr. Christoph Berger
Contemporary Issues in Business Information Systems (Seminar)	WIB21-WPM-I-706	P450-0019	6	1V+1S	3	Prof. Dr. Daniel F. Abawi
Current Topics in (Business) Informatics (Seminar)	WIB21-WPM-I-709	P450-0002	-	1SU+1S	3	Prof. Dr. Daniel F. Abawi
Design Thinking for Agile Innovation	WIB21-WPM-I-701	P420-0542	5	4PA	5	Prof. Dr.-Ing. Christian Köhler

Module name (EN)	Code	SAP-P	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator
Economic Foundations and the Political Framework of the German Energy Industry	WIB21-WPM-W-403	P420-0400	-	2V+2SU	5	Prof. Dr. Uwe Leprich
Electrical Engineering Practical Course	WIB21-WPM-T-108	P450-0203	-	1P+1PA	3	Prof. Dr. Rudolf Friedrich
Fluid Dynamics	WIB21-WPM-T-101	P450-0039	5	2V+2U	5	Prof. Dr. Frank Ulrich Rückert
Fluid Energy Machines	WIB21-WPM-T-102	P450-0040	5	1V+1U	3	Prof. Dr. Frank Ulrich Rückert
Holistic Production Systems and their Methods	WIB21-WPM-I-707	P450-0046	5	2V+1U+1P	5	Prof. Dr.-Ing. Dieter Arendes
International Project Week	WIB21-WPM-I-700	P400-0002	5	2PA	2	Prof. Dr. Marco Günther
Introduction to Energy Technology	WIB21-WPM-T-105	P450-0023	-	1V+1U	3	Prof. Dr. Rudolf Friedrich
Investment Strategies	WIB21-WPM-W-405	P450-0393	6	-	5	Prof. Dr. Stefan Georg
Leadership and Team Management	WIB21-WPM-S-900	P450-0064	5	2V+2U	5	Prof. Dr. Petra Garnjost
Lean Startup	WIB21-WPM-I-711	P450-0387	1	2V+1SU+1U	5	Prof. Dr. Alexander Pöschl
	WIB21-WPM-T-112	P450-0391	5	1V+1U	3	Studienleitung

Module name (EN)	Code	SAP-P	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator
Maintenance Planning						
Mathematics III	WIB21-WPM-T-111	P450-0068	-	2V+2U	5	Prof. Dr. Frank Kneip
Principles of Supply Networks and Systems	WIB21-WPM-T-106	P450-0050	-	1V+1U	3	Prof. Dr. Rudolf Friedrich
Procurement Management	WIB21-WPM-I-708		-	1V+1U	3	Studienleitung
Quality Techniques (Seminar, English)	WIB21-WPM-I-705	P450-0084	6	2SU	3	Prof. Dr. Christoph Berger
Research Seminar	WIB21-WPM-I-702	P450-0086	5	2SU+2S	5	Prof. Dr.-Ing. Christian Köhler
Technical Sales and Distribution (Seminar)	WIB21-WPM-I-703	P450-0089	6	1SU+1S	3	Prof. Dr.-Ing. Christian Köhler
Thermal Energy Systems	WIB21-WPM-T-116	P450-0394	-	4VU	5	Prof. Dr. Frank Ulrich Rückert
Using Mathematical Software	WIB21-WPM-T-110	P450-0006	-	1V+1U	3	Prof. Dr. Frank Kneip
Valuation (English)	WIB21-WPM-W-400	P450-0096	5	1V+1U	3	Prof. Dr. Andy Junker

(27 modules)

Industrial Engineering Bachelor - mandatory courses

Business and Technical English

Module name (EN): Business and Technical English
Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021
Module code: WIB21-510
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 5
Semester: 5
Mandatory course: yes
Language of instruction: English
Assessment: Exam [*updated 15.04.2024*]
Exam recurrence: The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).
Applicability / Curricular relevance: WIB21-510 (P450-0282) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 5, mandatory course WINF-B23-160 (P460-0006) Digital Business and IT, Bachelor, SO 01.10.2023 , semester 1, mandatory course WINF-B25-150 (P460-0006) Digital Business and IT, Bachelor, SO 01.10.2025 , semester 1, mandatory course
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 150 hours (equivalent to 5 ECTS credits). There are therefore 105 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 Tinnefeld

Lecturer:
Corinna Huth

[*updated 07.05.2021*]

Learning outcomes:
After successfully completing this module, students will:
Be able to apply advanced reading comprehension techniques in order to read longer written texts in a foreign language with economic and technical content and to decode the points of view expressed therein - with regard to both global and detailed comprehension.
Have acquired business and technical vocabulary and be able to use it productively in their own spoken and written texts, including writing emails, letters of complaint, business reports and proposals.
Be able to deal in-depth with the intercultural characteristics of the target language countries and to apply the acquired intercultural awareness to a considerable range of concrete situations in encounters with representatives of these cultures and to implement them adequately in terms of communication.
Be able to intellectually analyze relevant spoken and written business English texts and independently understand concrete examples of these.

[*updated 15.04.2024*]

Module content:
The content includes:
Business-related skills relevant to working life, e.g:
Business etiquette and business travel
Intercultural communication
Making telephone calls
Behavior in meetings
Preparation and negotiating
Technical matters, e.g:
Linguistic behavior in production and operation
Material technology
Assessment of energy sources and their sustainability
Technology and innovations
Writing skills: Creation of, for example:
E-mail correspondence
Letters of complaint
Annual reports
Minutes of meetings
Practicing presentation techniques
Teaching vocabulary for the above-mentioned areas
Expanding students´ command of grammar and, if necessary, repeating areas where improvement is required

[*updated 15.04.2024*]

Teaching methods/Media:
Partner work
Group work phases where students tackle specific tasks
Interactive, multimedia language lab
Short talks by the students
Using artificial intelligence as a learning partner

[*updated 15.04.2024*]

Recommended or required reading:
Recommended literature will be announced at the beginning of the semester.

[*updated 15.04.2024*]

Computer Science / Programming

Module name (EN): Computer Science / Programming

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-340

Hours per semester week / Teaching method:
2V+2U (4 hours per week)

ECTS credits:
5

Semester: 3

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 30.04.2025*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIB21-340 (P450-0287) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 3, mandatory course
WINF-B23-150 (P460-0005) Digital Business and IT, Bachelor, SO 01.10.2023 , semester 1, mandatory course
WINF-B25-160 (P460-0005) Digital Business and IT, Bachelor, SO 01.10.2025 , semester 1, mandatory course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:
WIB21-440 Programming Project
WIB21-520
WIB21-530

[*updated 21.04.2025*]

Module coordinator:
Prof. Dr. Daniel F. Abawi

Lecturer:
Prof. Dr. Daniel F. Abawi
Michael B. Schmidt

[*updated 21.04.2025*]

Learning outcomes:
Principles of computer science:
After successfully completing this module students will:
be able to explain and categorize basic computer science knowledge with a focus on practical computer science
be able to understand and describe the basic structure of programs
be able to explain and partially implement the conversion of a business problem into an algorithm, from modeling to technical implementation

Programming:
After successfully completing this module, students will:
be able to independently integrate practical, business-related tasks into a programmable implementation concept
be able to map processes and structures using Unified Modeling Language (UML) and model business processes accordingly
gain practical experience in using the object-oriented programming language Python

[*updated 30.04.2025*]

Module content:
Principles of computer science:
1. History and sub-areas of computer science
2. Storing and interpreting information / encodings
a. Positional number systems
b. Computing with dual numbers
c. Data compression
d. Fault-tolerant codes
3. From program to machine program
4. Programming languages
a. Data types and operators
b. Control structures
c. Propositional logic
d. Object orientation
5. Data structures and algorithms
6. Computer networks and the WWW
7. Software engineering
a. UML diagrams (static and dynamic behavior of information systems)

b. Process models

Programming:
Basics
1. Objects and classes
2. Data types and basic operators
3. Class definitions and inheritance
4. Object interaction
5. Control structures
6. Using class libraries
7. Class design
8. Structured design of simple programs
9. Elements of software engineering
10. Documentation and tools for teamwork

[*updated 30.04.2025*]

Teaching methods/Media:
Principles of computer science:
Projector, slides, exercises, lecture notes

Programming:
Projector, slides (lecture notes), independent and guided exercises and sample solutions. Only open source software will be used.

[*updated 30.04.2025*]

Recommended or required reading:
Principles of computer science:
Herold, H.; Lurz, B.; Wohlrab, J.: Grundlagen der Informatik, Pearson Studium Verlag, 2017
Hartmut, Ernst: Grundkurs Informatik, 4. Auflage, Vieweg+Teubner Verlag, 2016
Your own lecture notes

Programming:
Herold, H.; Lurz, B.; Wohlrab, J.: Grundlagen der Informatik, Pearson Studium Verlag, 2017
Your own lecture notes

Further recommendations regarding literature or for example, web articles will be made by the lecturer in the course.

[*updated 30.04.2025*]

Cost Accounting and the Basics of Management Accounting

Module name (EN): Cost Accounting and the Basics of Management Accounting

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-310

Hours per semester week / Teaching method:

2V+2U (4 hours per week)

ECTS credits:
5

Semester: 3

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 23.09.2025*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIB21-310 (P450-0290) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 3, mandatory course
WINF-B23-310 (P460-0013) Digital Business and IT, Bachelor, SO 01.10.2023 , semester 3, mandatory course
WINF-B25-310 (P460-0013) Digital Business and IT, Bachelor, SO 01.10.2025 , semester 3, mandatory course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
WIB21-110 General Business Administration

[*updated 22.10.2024*]

Recommended as prerequisite for:
WIB21-410
WIB21-430

[*updated 28.11.2025*]

Module coordinator:
Prof. Dr. Stefan Georg

Lecturer:
Alexander Hamman, M.Sc.

Stefanie Scherer

[*updated 21.05.2021*]

Learning outcomes:
After successfully completing this module, students will:
be able to describe and understand the tasks and structure of operational cost accounting
be able to work on (simple) problems within the cost accounting system and find solutions
be able to systematize cost types and calculate the amount of material costs, personnel costs, and imputed costs
be able to perform internal cost allocation as part of cost center accounting using a cost allocation sheet.
be able to perform cost unit calculations based on standard calculation methods
be able to apply selected controlling tools such as simple and multi-level contribution margin accounting and interpret their results

[*updated 23.09.2025*]

Module content:
1. Basic concepts of accounting
2. Cost allocation principles
3. Structure of cost accounting systems
4. Cost element accounting (in particular personnel costs, material costs, depreciation)
5. Cost center accounting (in particular operating statement, internal cost allocation)
6. Cost object accounting (in particular division costing, surcharge calculation, joint cost allocation, price calculation)
7. Selected management accounting methods: Contribution costing (single-level and multi-level structure, areas of application)

The theoretical aspects of all topics will be presented in a logical order and consolidated through numerous exercises.

[*updated 23.09.2025*]

Teaching methods/Media:
Students will receive a catalog of questions, a catalog of exercises, and a complete schedule indicating which questions and exercises are to be prepared independently by the students using literature/sources during which week of the module. The lecture will be supported digitally by detailed teaching materials (e.g., video files, audio files, learning snacks, specialist texts, quizzes, glossary), which will be made available via the university´s e-learning system. In the exercise session, the students´ solutions to extensive exercise questions will be discussed and open questions answered. In other words, there will be no traditional frontal teaching, but instead students will be coached.

[*updated 23.09.2025*]

Recommended or required reading:
Georg, Stefan: Produktkalkulation, aktuelle Auflage
Georg, Stefan: Das Übungsbuch zur Kostenrechnung, aktuelle Auflage
Langenbeck, Jochen.: Kosten- und Leistungsrechnung, aktuelle Auflage
Wöltje, Jörg: Kosten- und Leistungsrechnung, aktuelle Auflage

[*updated 23.09.2025*]

General Business Administration

Module name (EN): General Business Administration

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-110

Hours per semester week / Teaching method:
2V+2U (4 hours per week)

ECTS credits:
5

Semester: 1

Mandatory course: yes

Language of instruction:
German

Assessment:
Written exam

[*updated 23.09.2025*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIB21-110 (P450-0278) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 1, mandatory course
WINF-B23-110 (P460-0002) Digital Business and IT, Bachelor, SO 01.10.2023 , semester 1, mandatory course
WINF-B25-110 (P460-0002) Digital Business and IT, Bachelor, SO 01.10.2025 , semester 1, mandatory course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:
WIB21-210
WIB21-310 Cost Accounting and the Basics of Management Accounting
WIB21-320
WIB21-410

WIB21-420 Private Commercial Law
WIB21-430
WIB21-610 Moderation and Leadership / Communication
WIB21-620
WIB21-WPM-W-405 Investment Strategies

[*updated 28.11.2025*]

Module coordinator:
Prof. Dr. Stefan Georg

Lecturer:
Dipl.-Betr.W. Peter Huber (lecture/exercise)
Stefanie Scherer (lecture/exercise)

[*updated 31.05.2021*]

Learning outcomes:
After successfully completing this module, students will:
be able to explain the basic concepts of business administration and apply them to individual areas of a company
demonstrate a fundamental understanding of entrepreneurial thinking and action for the individual sub-areas of business administration, particularly with regard to corporate goals
be able to explain current topics in business administration, such as sustainability, digitalization, or the use of AI in companies
be able to draw initial conclusions by using the terms and concepts learned for simple business questions

[*updated 23.09.2025*]

Module content:

1. Basic business knowledge (economic cycle, types of goods, economic sectors, factors of production, economic principles, effectiveness and efficiency, corporate goals, location factors)
2. Corporate structure (legal forms, partnerships, corporations, mergers, cartels, employees)
3. Organization (organizational structure, process organization, branches & subsidiaries, franchising)
4. Personnel and work (personnel management, personnel requirements, recruitment, working time models, remuneration, co-determination, gender equality)
5. Operational functions (value chain, procurement, manufacturing, marketing, sales)
6. Accounting (flow variables, external accounting, internal accounting, balance sheet structure, cost accounting system structure)
7. Investment and financing (types of investment, investment objectives, financing options, capital market, stock exchange, shares, cost average effect)
8. Controlling & taxation (big data, key performance indicators, balanced scorecard, corporate taxes, sales tax, income tax)
9. Digitalization in companies (digital business models, digital marketing, AI and machine learning, digital payment systems)
10. Sustainability (sustainability goals, climate protection, CO2 trading, e-mobility, renewable energies)

[*updated 23.09.2025*]

Teaching methods/Media:

The individual topics will be illustrated and explored in greater depth through real-life company reports and press quotes, as well as exercises. We will focus on using the terms and tools learned. A book accompanying the lecture will be published.

[*updated 23.09.2025*]

Recommended or required reading:
Amely, Krickhahn: BWL für Dummies. Wiley-VCH, aktuelle Auflage
Georg: Wirtschaft verstehen. Grundlagen und aktuelle Themen der Betriebswirtschaftslehre. Epubli, aktuelle Auflage
Hutzschenreuter: Allgemeine Betriebswirtschaftslehre. Grundlagen mit zahlreichen Praxisbeispielen. Springer, aktuelle Auflage
Opresnik, Rennhak: Allgemeine Betriebswirtschaftslehre. Grundlagen unternehmerischer Funktionen. Springer, aktuelle Auflage
Wöhe, Döring et al.: Einführung in die Allgemeine Betriebswirtschaftslehre. Vahlen, aktuelle Auflage

[*updated 23.09.2025*]

Moderation and Leadership / Communication

Module name (EN): Moderation and Leadership / Communication

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-610

Hours per semester week / Teaching method:
2V+2U (4 hours per week)

ECTS credits:
5

Semester: 6

Mandatory course: yes

Language of instruction:
German

Assessment:
Oral presentation im Submodule Moderation and Leadership (50%); Written composition (research paper, term paper) im Submodule: Communication (50%)
Note: Each exam must be passed on its own.

[*updated 15.04.2024*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIB21-610 (P450-0293, P450-0294) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 6, mandatory course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
WIB21-110 General Business Administration
WIB21-210
WIB21-330

[*updated 06.11.2025*]

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer:
Dozierende des Studiengangs

[*updated 06.11.2025*]

Learning outcomes:
MODERATION & LEADERSHIP: (Lecturer: Dipl.-WirtschIng. Andreas NOSS)
After successfully completing this module students will:
be able to assess the possibilities and limits of communication tools for avoiding and smoothing out conflict situations

be able to apply knowledge and skills to confidently lead discussion and deal with conflict processes
have mastered the interplay of communication and moderation for employee management and motivation
be able to apply the common methods for mediating decision-making and conflict processes in the company in a targeted manner

be able to use moderation techniques to resolve conflicts arising from different cultural backgrounds in a conciliatory manner

COMMUNICATION: (Lecturer: Dipl.-Sportwiss. Susanne SEELIGER)
After successfully completing this module students will:
be able to name and explain the central characteristics of communication
be able to name and explain the central characteristics of intercultural communication
be familiar with the advantages and disadvantages of different presentation styles and techniques through their own experience
be able to apply basic negotiation techniques
be able to consider and implement different aspects of moderation
be able to distinguish the special features of communication and presentation situations in the

engineering environment from those in other environments and be able to respond appropriately in order to achieve their goal

[*updated 15.04.2024*]

Module content:
MODERATION & LEADERSHIP: (Noss)
1. Moderator
2. Communication as the basis for moderation
3. Principles of mediation
4. Guide to moderating
5. Cultural aspects of moderation

COMMUNICATION: (SEELIGER)
1. Principles of communication
2. Communication theories and methods
3. Basics of intercultural communication
4. Communication in the field of engineering
5. Basic negotiation techniques
6. Rhectoric and body language
7. Presentation techniques
8. Moderation and mediation

[*updated 15.04.2024*]

Teaching methods/Media:
Moderation & Leadership: (Noss)
Interactive seminar. After an input phase by the lecturer - using various thematic examples - moderation and mediation processes are prepared and "played through" by the students. In "role-plays" the participants demonstrate that they can implement the content they have learned.

Communication: (SEELIGER)
Regularly revised lecture notes will be published for this course. Work in small groups, flip charts, DVDs and multimedia learning software

[*updated 15.04.2024*]

Recommended or required reading:
Moderation & Leadership:

Edmüller, A./Wilhelm, T.: Moderation; Haufe Lexware; 6.Auflage; 2015
Funke, A./ Havenith, E.: Moderations-Tools; ManagerSeminare Verlag; 6. Auflage; 2019
Hartmann, M./ Rieger, M.: Zielgerichtet moderieren; Beltz Verlag; 6. A.; 2012
Jiranek, H./Edmüller, A.: Konfliktmanagement, Haufe, 5. A., 2017
Redlich, A./Schrader, E.: Konfliktmoderation mit Gruppen, Feldhaus;, 8. A.; 2019
Tirok, M.: Moderieren; UVK; 2013

Kommunikation (Auszug):

Seibert, J. W.: Visualisieren, Präsentieren, Moderieren, erw. 30. Aufl., Gabal 2012
Vogt, Gustav: Erfolgreiche Rhetorik, 3. Auflage Oldenburg Verlag 2010.

Molcho, Samy: Das ABC der Körpersprache, Ariston 2011.
Ebel, H.F. / Bliefert, C. / Kellersohn, A.: Erfolgreich kommunizieren Ein Leitfaden für Ingenieure, 1.
Auflage, Wiley VCH Verlag 2000.
Meinholz, Heinz et al.: Führungskraft Ingenieur, Teubner 2010.
Tenopir; Carol, Communication Patterns of Engineers; John Wiley & Sons 2004.
Watzlawick, P., et al., Menschliche Kommunikation, 12. Auflage, Huber 2011.
Schulz von Thun, Friedemann et al., Miteinander reden - Kommunikationspsychologie für Führungskräfte; ROWOHLT
2008.
Hackenberg, W., et.al.: Key Message. Business Presentations with Structure, Haufe 2011.
Bohinc, T.: Kommunikation im Projekt, Gabler 2014.
Bohinc, T.: Führung im Projekt, Springer Gabler 2012.
Henkel, P.: Besser wirken, mehr bewirken! So überzeugen Sie Kunden und Geschäftspartner mit professionellen
Präsentationen, Springer Gabler 2014.
Birkenbihl, V.F.: Kommunikationstraining. Zwischenmenschliche Beziehungen erfolgreich gestalten. mvg Verlag
2017.
Lecture notes

[*updated 15.04.2024*]

Private Commercial Law

Module name (EN): Private Commercial Law
Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021
Module code: WIB21-420
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 5
Semester: 4
Mandatory course: yes
Language of instruction: German
Assessment: Exam [*updated 29.04.2024*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIB21-420 (P450-0308) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 4, mandatory course
WINF-B23-420 (P460-0021) Digital Business and IT, Bachelor, SO 01.10.2023 , semester 4, mandatory course
WINF-B25-220 (P460-0021) Digital Business and IT, Bachelor, SO 01.10.2025 , semester 2, mandatory course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
WIB21-110 General Business Administration

[*updated 28.10.2021*]

Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Esther Bollhöfer

Lecturer:
Prof. Dr. Holger Buck
Dozierende des Studiengangs

[*updated 28.10.2021*]

Learning outcomes:
After successfully completing this module students will
- be familiar with the most important types of contracts in commercial law, in particular sales law and its right of warranty
- be familiar with commercial and corporate law
- be familiar with the functions and mechanisms of business, commercial and corporate law
- understand the law as one of the basic conditions for entrepreneurial activity and the relevance of the regulations for business practice
- be able to incorporate legal considerations into the operational of a company
- will be able to handle relevant legal texts independently
- will be able to develop proposals for solutions to specific cases relating to purchase, commercial and corporate law, by classifying the problem, subsuming the facts under the characteristics of the relevant regulations and deriving the result therefrom
- will have developed drafting proposals for simple legal transactions,
- be able to evaluate and review the results based on general legal value judgements.

[*updated 29.04.2024*]

Module content:
1. Civil law
- Law, the legal system, law enforcement
- Legal entities in private law
- Freedom of contract and its limits, abstraction principle
- Legal transactions and declaration of intent
- All about contracts (introduction, steps involved in concluding a contract, effect of the contract, special features of a consumer contract)
- Basic features of the law on general terms and conditions (definition, inclusion, reference to content control)
- Agency according to BGB
- Destruction and nullity of legal transactions (selected topics, including nullity due to lack of form)
- Debtor and creditor, cession, joint and several liability
- Performance by the seller (place of performance, transfer of risk, time of performance, retention of title)
- Performance by the buyer (payment, set-off)
- Statutory limitation
- Laws governing performance disruptions using the purchase contract as an example (withdrawal and compensation for damages according to BGB, warranty for material defects according to BGB)
- Overview of special obligations and a selection of important contract types (purchase contract, contract for work and services and contract for work and materials)

2. Principles of commerical law
- Significance, tasks and functions,
- Merchant status
- The appearance of merchants and the protection of legal transactions (company name, commercial and business register)
- Conclusion of contracts by dependent auxiliary persons (procuration, power of attorney)
- Basic features of commercial transactions (in particular § 377 HGB)

3. Principles of corporate law
- Types of enterprises for economic purposes and their selection
- Overview of the most important corporate forms
- Overview of partnerships
- Corporations based on the example of the GmbH

[*updated 29.04.2024*]

Teaching methods/Media:
Interactive lecture with integrated tutorial (Solving legal issues)
Visualization by means of transparencies
Learning material from the internal eLearning management system

[*updated 29.04.2024*]

Recommended or required reading:
- Brox, H. / Walker, W.-D. Allgemeines Schuldrecht. München: C. H. Beck, aktuelle Auflage
- Brox, H./Walker, W.-D., Besonderes Schuldrecht. München: C. H. Beck, aktuelle Auflage
- Brox, H. / Henssler, M., Handelsrecht. München: C. H. Beck, aktuelle Auflage
- [Führich, E., Wirtschaftsprivatrecht. München: Franz Vahlen, 13. Auflage 2017, teilweise überholt]
- Führich, E./Werdan, I. Wirtschaftsprivatrecht in Fällen und Fragen. München: Franz Vahlen, aktuelle Auflage
- Gildeggen, R. u. a. Wirtschaftsprivatrecht: Kompaktwissen für Betriebswirte. Berlin; Boston: de Gruyter Oldenbourg, aktuelle Auflage (e-book in htwsaar-Bibliothek)
- Güllemann, D. Wirtschaftsprivatrecht: BGB Allgemeiner Teil, Schuldrecht, Sachenrecht, Handels- und Gesellschaftsrecht. München: Franz Vahlen, aktuelle Auflage

- Kindler, P., Grundkurs Handels- und Gesellschaftsrecht. München: C. H. Beck, aktuelle Auflage
- Metzler-Müller, K. Wie löse ich einen Privatrechtsfall. Stuttgart: Boorberg, aktuelle Auflage
- Saenger, I., Gesellschaftsrecht. München: Franz Vahlen, aktuelle Auflage

[*updated 29.04.2024*]

Programming Project

Module name (EN): Programming Project

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-440

Hours per semester week / Teaching method:
1V+3PA (4 hours per week)

ECTS credits:
5

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:
Project work

[*updated 30.04.2025*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIB21-440 (P450-0300) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 4, mandatory course
WINF-B23-440 (P460-0023) Digital Business and IT, Bachelor, SO 01.10.2023 , semester 4, mandatory course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
WIB21-330
WIB21-340 Computer Science / Programming

[*updated 21.04.2025*]

Recommended as prerequisite for:
WIB21-520
WIB21-530

[*updated 29.10.2021*]

Module coordinator:
Prof. Dr. Daniel F. Abawi

Lecturer:
Prof. Dr. Daniel F. Abawi
Michael B. Schmidt

[*updated 21.04.2025*]

Learning outcomes:
Programming Project:
After successfully completing this module, students will:
be able to explain and partially implement the conversion of a business problem into an algorithm, from modeling to technical implementation.
be able to independently integrate practical, business-related tasks into a programmable implementation concept (by means of a group project)
be able to map processes and structures using Unified Modeling Language (UML) and model business processes accordingly
gain practical experience in using the programming language Python

[*updated 30.04.2025*]

Module content:

Advanced knowledge in...
1. Objects and classes
2. Data types and basic operators
3. Class definitions and inheritance
4. Object interaction
5. Control structures
6. Using class libraries
7. Class design
8. Structured design of simple programs
9. Elements of software engineering
10. Documentation and tools for teamwork
11. Case study and project

[*updated 30.04.2025*]

Teaching methods/Media:
Projector, slides (lecture notes), independent and guided exercises and sample solutions. Only open source software will be used.

[*updated 30.04.2025*]

Recommended or required reading:
Your own lecture notes
Herold, H.; Lurz, B.; Wohlrab, J.: Grundlagen der Informatik, Pearson Studium Verlag, 2017

Further recommendations regarding literature or for example, web articles will be made by the lecturer in the course.

[*updated 30.04.2025*]

Technical Mechanics 1

Module name (EN): Technical Mechanics 1

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-250

Hours per semester week / Teaching method:
2V+2U (4 hours per week)

ECTS credits:
5

Semester: 2

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 30.04.2025*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIB21-250 (P450-0303) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 2, mandatory course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).

There are therefore 105 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
WIB21-160

[*updated 02.04.2025*]

Recommended as prerequisite for:
WIB21-350 Technical Mechanics 2
WIB21-450
WIB21-460

[*updated 02.04.2025*]

Module coordinator:
Prof. Dr. Frank Ulrich Rückert

Lecturer:
Torsten Schmidt

[*updated 02.04.2025*]

Learning outcomes:
After successfully completing this module, students will:
be able to determine forces and force effects and represent them graphically and mathematically
be able to mathematically, derive equilibrium conditions from them, and determine bearing forces and moments
be able to determine the internal forces and moments acting on a body when external forces exist
be able to explain the physical principles of friction and determine the conditions under which a system with frictional forces is stable

[*updated 30.04.2025*]

Module content:
1. Force concept, force and moment effects on the basis of Newton´s axioms
2. Graphic and mathematical determination of resulting forces and moments
3. Applications with central and flat force systems, e.g. bearing forces
4. Normal forces, shear forces, internal moment effect
5. Beams, two-part systems and trusses
6. Friction
7. Centroid

[*updated 30.04.2025*]

Teaching methods/Media:
Lecture with integrated exercises

[*updated 30.04.2025*]

Recommended or required reading:

Holzmann, G./ Meyer H./ Schumpich G.: Technische Mechanik, Statik; 12. Auflage, Vieweg+Teubner Verlag, 2009

Böge, A.: Technische Mechanik Statik-Dynamik-Fluidmechanik-Festigkeitslehre; 28. Auflage, Vieweg+Teubner-Verlag, 2009

Gross, D./ Hauger, W./ Schröder, J./ Wall, W.: Technische Mechanik 1 - Statik; 11. Auflage, Springer Verlag, 2011

Böge, A./ Schlemmer, W.: Aufgabensammlung zur Mechanik und Festigkeitslehre, 17. Auflage, Vieweg Verlag, 2003

[*updated 30.04.2025*]

Technical Mechanics 2

Module name (EN): Technical Mechanics 2

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-350

Hours per semester week / Teaching method:
2V+2U (4 hours per week)

ECTS credits:
5

Semester: 3

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 30.04.2025*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIB21-350 (P450-0304) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 3, mandatory course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
WIB21-160
WIB21-250 Technical Mechanics 1

[*updated 02.04.2025*]

Recommended as prerequisite for:
WIB21-450
WIB21-460

[*updated 24.05.2021*]

Module coordinator:
Prof. Dr. Frank Ulrich Rückert

Lecturer:
Torsten Schmidt

[*updated 02.04.2025*]

Learning outcomes:
After successfully completing this module, students will:
be able to infer the internal forces and moments acting on a component from external loads and determine the resulting stresses
be able to recognize which stresses result in which deformations and calculate them
be able to determine whether a structural component can withstand a given load resp. be able to dimension it sufficiently

[*updated 30.04.2025*]

Module content:
Strength of Materials:
1. Effects of internal forces on materials: stress (normal stress, tangential stress)
2. Theory of Elasticity: elastic deformation of structural components (bending of straight bars, shearing, twisting)
3. Uniaxial and biaxial stress states; fracture hypotheses

[*updated 30.04.2025*]

Teaching methods/Media:
Lecture with integrated exercises

[*updated 30.04.2025*]

Recommended or required reading:
Holzmann, G./ Meyer H./ Schumpich G.: Technische Mechanik, Festigkeitslehre, 9. Auflage, Teubner Verlag, 2006
Böge, A.: Technische Mechanik Statik-Dynamik-Fluidmechanik-Festigkeitslehre; 28. Auflage, Vieweg+Teubner-Verlag, 2009
Gross, D./ Hauger, W./ Schröder, J./ Wall, W.: Technische Mechanik 2 - Elastostatik, 9. Auflage,

Springer-Verlag, 2007

[*updated 30.04.2025*]

Industrial Engineering Bachelor - optional courses

Automation Technology

Module name (EN): Automation Technology

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-I-704

Hours per semester week / Teaching method:
2V+2PA (4 hours per week)

ECTS credits:
5

Semester: 5

Mandatory course: no

Language of instruction:
English

Assessment:
Project work with presentation

[*updated 19.01.2022*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-Ing22 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course, general subject
WIB21-WPM-I-704 (P450-0007) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 5, optional course, general subject

Suitable for exchange students (learning agreement)

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):

None.

Recommended knowledge:
good knowledge of English is recommended

[*updated 19.01.2022*]

Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Frank Kneip

Lecturer: Prof. Dr. Frank Kneip

[*updated 09.02.2022*]

Learning outcomes:
Students, who successfully passed this module, are able to
decribe different sensors, their functional principle and corresponding advantages/disadvantages
decribe different actuators, their functional principle and corresponding advantages/disadvantages
decribe different hydraulic components, their functional principle and corresponding advantages/disadvantages
decribe different control strategies, and are able to select suitale control approaches with respect to their application in a given system
select suitable components in order to provide a suitable functionality of a given system and substantiate the reasons for the selection
develop a concept for a prototypical implementation of a given system and build the concept using e.g. a microcontroller (Arduino,...) and corresponding sensors, actuators,...

[*updated 30.11.2019*]

Module content:
Part 1: Lecture

1. Sensors
   - 1.1 Fundamentals of sensors
   - 1.2 Analysis of selceted sensors (functional principle, advantages/disadvantages)
   - 1.3 Application of sensors in systems

2. Actuators
   - 2.1 Fundamentals of actuators
   - 2.2 Analysis of selceted actuators(functional principle, advantages/disadvantages)
   - 2.3 Application of actuators in systems

3. Hydraulic components
   - 3.1 Fundamentals of hydraulic components
   - 3.2 Analysis of selceted hydraulic components (functional principle, advantages/disadvantages)
   - 3.3 Application of hydraulic components in systems

4. Control strategies
   - 4.1 Feedforward and Feedback control
   - 4.2 Discontinous controllers
   - 4.3 Continous controllers (in particular P-, I-, PI-, PD-, PID-controller)

4.4 Controller parametrisation
4.5 Properties of the different controller types
4.6 Applications of different controller types in systems

Part 2: Implementation of a prototypical system
1. Analysis of the requirements
2. Concept development and selection of the components
3. Prototypical implementation of the system sing e.g. a microcontroller (Arduino,...) and corresponding sensors, actuators,...

[*updated 20.01.2020*]

Teaching methods/Media:
Lecture and group work

[*updated 30.11.2019*]

Additional information:
This module is suitable for incoming students with a learning agreement

[*updated 30.11.2019*]

Recommended or required reading:
Fraden, J.: Handbook of Modern Sensors Physics, Designs, and Applications, Springer, 2016
Heimann, Gerth, Popp: Mechatronics: Components Methods Examples, Carl Hanser Verlag, 2006
Isermann, R.: Mechatronic Systems: Fundamentals, Springer, 2005
Mühl, T.: Introduction to electrical Measurement Technology; Vieweg und Teubner, 2008

Pan, T., Zou, Y.: Designing Embedded Systems with Arduino: A Fundamental Technology for Makers. Springer, 2018

[*updated 20.01.2020*]

Business Planning (Seminar)

Module name (EN): Business Planning (Seminar)

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-W-402

Hours per semester week / Teaching method:
2SU+2S (4 hours per week)

ECTS credits:
5

Semester: 6

Mandatory course: no

Language of instruction:
German

Assessment:
Project, class presentation

[*updated 23.08.2018*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-W5 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 6, optional course
WIB21-WPM-W-402 (P450-0015) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 6, optional course

Suitable for exchange students (learning agreement)

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 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 09.02.2022*]

Learning outcomes:
After successfully completing this module students will:
- know the components of a business plan.
- be able to develop a new business idea
- be able to create a realistic business plan.
- be able to show the connections between individual subplans.
- be able to present their business plan in a presentation.

[*updated 23.08.2018*]

Module content:
1. Business idea, location, legal form
2. Organization and personnel planning
3. Market analysis and market entry concept
4. Marketing plan

5. Investment, capital requirements and financial plan
6. Sales, cost and profit plan
7. Liquidity plan
8. Opportunity and risk analysis (SWOT analysis)

[*updated 23.08.2018*]

Teaching methods/Media:
As a team, students will create their own business plan. This will be accompanied by lectures and support from the lecturer. In addition, students will become familiar with the wide range of information on business plans available on the Internet, with particular emphasis on what the Federal Ministry of Economics has to offer.

[*updated 23.08.2018*]

Recommended or required reading:
_ www.sog.saarland.de und www.existenzgruender.de
_ Unterlagen zum StartUp Business Plan Wettbewerb der Sparkassen (Documents on the StartUp Business Plan Competition from the Sparkasse)
_ Arnold, J.: Existenzgründung: Businessplan und Chancen, UVIS Verlag 2013
_ Georg, S.: Fragen und Antworten zur Existenzgründung, CreateSpace 2014
_ Lutz, A.;Bussler, Chr.: Die Business Plan-Mappe: 40 Beispiele aus der Praxis, Linde Verlag, 4. Auflage 2015
_ Vogelgesang, E.; Fink, Chr., Baumann, M.: Existenzgründung und Business Plan, Erich-Schmidt-Verlag, 2015

[*updated 23.08.2018*]

Complementary Basics of Engineering

Module name (EN): Complementary Basics of Engineering

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-T-100

Hours per semester week / Teaching method:
2SU+2S (4 hours per week)

ECTS credits:
5

Semester: 5

Mandatory course: no

Language of instruction:
English

Assessment:
Written composition with presentation

[*updated 14.03.2018*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBAS-450/550-M2i Industrial Engineering, Bachelor, ASPO 01.10.2007 , semester 4, optional course, technical
WIBASc-525-625-Ing16 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course, technical
WIB21-WPM-T-100 (P450-0017) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 5, optional course, technical

Suitable for exchange students (learning agreement)

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Alexander Hamman, M.Sc.

Lecturer: Alexander Hamman, M.Sc.

[*updated 09.02.2022*]

Learning outcomes:
After successfully completing this module students will:
_ be able to independently write an English-language scientific term paper and give a presentation.
_ have mastered basic techniques for imparting new knowledge.
_ have command of a basic English technical vocabulary in various scientific and technical disciplines.
_ have gained enough experience with LaTeX to prepare scientific papers with a given template.

[*updated 23.08.2018*]

Module content:
Preparation for the seminar:
_ Introduction to LaTeX
_ Using BibTex
_ Information about the characteristics and problems of the LaTeX environment TeXnicCentre
_ Clarification of special framework conditions, especially with regard to American templates

Term paper:
Participants will read and work independently on a given topic and then present their findings in accordance

with the principles of proper scientific work.

Module content:
Seminar topics include, among others:
_ Mechanical engineering
_ Electrical engineering
_ Civil engineering
_ Energy engineering
_ Environmental engineering or
_ Software engineering

All of the topics will be touched upon briefly in the course of the current curriculum.

[*updated 23.08.2018*]

Recommended or required reading:
_ Murray, N. / Beglar, D.: Writing dissertations and theses; Prentice Hall International (25. Juni 2009)
_ Schlosser, J.: Wissenschaftliche Arbeiten schreiben mit LaTeX; Heidelberg [u.a.]: mitp-Verl., 2014
_ Additional literature will be announced depending on the topics dealt with in the course.

[*updated 14.03.2018*]

Consulting (Seminar, English)

Module name (EN): Consulting (Seminar, English)

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-W-401

Hours per semester week / Teaching method:
1SU+1S (2 hours per week)

ECTS credits:
3

Semester: 6

Mandatory course: no

Language of instruction:
English

Assessment:
Written composition with presentation

[*updated 14.03.2018*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-W6 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 6, optional course
WIB21-WPM-W-401 (P450-0018) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 6, optional course

Suitable for exchange students (learning agreement)

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. Christoph Berger

Lecturer: Prof. Dr. Christoph Berger

[*updated 09.02.2022*]

Learning outcomes:
After successfully completing this module students will:
_ be able to independently research a specific topic from the field of consulting resp. a consulting sub-market.
_ be able to write English-language documentation and give a presentation (assistance will be available at the beginning of the course) by themselves on a subject assigned to them.
_ be able to demonstrate their communicative skills by presenting and discussing their subject in English in front of their fellow students and the lecturer.
_ be able to follow and understand specialized lectures in English and solve problems by asking questions in English. In addition, they will have acquired a good overview of national and international consulting.

[*updated 13.09.2018*]

Module content:
1. Types of consulting/consulting markets
2. Professional and personal requirements for consultants
3. Legal foundations of consulting
4. Consulting acquisition
5. Consulting
6. Fee models
7. Communication in the consultancy process
8. International consulting
9. A closer look at consulting sub-markets

[*updated 14.03.2018*]

Teaching methods/Media:
Participants will receive a summary of each topic from their fellow classmates.
Presentations will be carried out using a laptop and projector.

[*updated 14.03.2018*]

Recommended or required reading:
_ Canibol/Hossenfelder (Hrsg.): Lünendonk Handbuch 2012; 2012
_ Deelmann, Consulting in Zahlen; epubli Verlag, 2012
_ Niedereichholz, Ch.: Unternehmensberatung; Band 1 + 2; Oldenbourg Wissenschaftsverlag, 2010
_ Niedereichholz, C. + J: Das Beratungsunternehmen; Oldenbourg Wissenschaftsverlag; 2012
_ Wohlgemuth, A.: Unternehmensberatung; 11. Auflage, vdf Hochschulverlag, 2010

[*updated 14.03.2018*]

Contemporary Issues in Business Information Systems (Seminar)

Module name (EN): Contemporary Issues in Business Information Systems (Seminar)

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-I-706

Hours per semester week / Teaching method:
1V+1S (2 hours per week)

ECTS credits:
3

Semester: 6

Mandatory course: no

Language of instruction:
English

Assessment:
Written composition (80% of the total grade) and a presentation (20% of the total grade)

[*updated 05.06.2025*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-FÜ34 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 6, optional course, general subject

WIB21-WPM-I-706 (P450-0019) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 6, optional course, general subject

Suitable for exchange students (learning agreement)

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. Daniel F. Abawi

Lecturer: Prof. Dr. Daniel F. Abawi

[*updated 09.02.2022*]

Learning outcomes:
After successfully completing this module, students will:
be able to use a procedure for editing a written academic paper
be able to structure and organize an academic paper appropriately
be able to independently organize writing a paper
be able to conduct a literature search on a scientific topic
be able to articulate themselves logically, objectively, and rationally in spoken form and present their findings to an audience of experts
be able to demonstrate in-depth knowledge in selected areas of computer science/business informatics

[*updated 05.06.2025*]

Module content:
Current topics and questions from the field of business informatics and informatics with reference to companies, economy and society.

Students will receive assistance on how to prepare a scientific paper and formulate it in writing. The use of IT-based tools will also be discussed. Sources for literature research will be presented.

[*updated 16.06.2025*]

Additional information:
The written elaboration can take place alternatively in German or English language.

[*updated 19.01.2022*]

Recommended or required reading:
Individual literature on selected topics will be named and made available to the participants (in English and

German as an introduction to the topic and for research purposes).

[*updated 05.06.2025*]

Current Topics in (Business) Informatics (Seminar)

Module name (EN): Current Topics in (Business) Informatics (Seminar)

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-I-709

Hours per semester week / Teaching method:
1SU+1S (2 hours per week)

ECTS credits:
3

Semester: according to optional course list

Mandatory course: no

Language of instruction:
German

Assessment:
Term paper, presentation

[*updated 13.09.2018*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-FÜ16 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 6, optional course
WIB21-WPM-I-709 (P450-0002) Industrial Engineering, Bachelor, ASPO 01.10.2021 , 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. Daniel F. Abawi

Lecturer: Prof. Dr. Daniel F. Abawi

[*updated 26.07.2023*]

Learning outcomes:
After successfully completing this module students will:
_ be familiar with approaches for working on a written scientific paper
_ be able to structure and organize a scientific paper adequately
_ be able to independently organize the execution of a written paper
_ be able to conduct a literature search on a scientific topic
_ be able to name the IT-based tools that are useful for writing scientific papers
_ have experience in communicating their results to an audience in a concise manner

[*updated 13.09.2018*]

Module content:
Current topics and questions from the field of business informatics and informatics with reference to companies, economy and society.

Students will receive assistance on how to prepare a scientific paper and formulate it in writing. IT-based tools will also be presented. Sources for literature research will be presented.

The term paper can be written in German or English.

[*updated 13.09.2018*]

Teaching methods/Media:
Projector, slides, examples for the term paper

[*updated 13.09.2018*]

Recommended or required reading:
Individual literature on selected topics will be named and made available to the participants (in English and German as an introduction to the topic and for research purposes).

[*updated 13.09.2018*]

Design Thinking for Agile Innovation

Module name (EN): Design Thinking for Agile Innovation

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-I-701

Hours per semester week / Teaching method:
4PA (4 hours per week)

ECTS credits:
5

Semester: 5

Mandatory course: no

Language of instruction:
English

Assessment:
Project work

[*updated 13.09.2018*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

IBB-650 (P420-0542) International Business, Bachelor, ASPO 01.10.2020 , semester 6, optional course, general subject
WIB21-WPM-I-701 (P420-0542) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 5, optional course, general subject

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 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. Christian Köhler

Lecturer: Prof. Dr.-Ing. Christian Köhler

[*updated 09.02.2022*]

Learning outcomes:
Students who have successfully completed this module, ...
... are familiar with the theoretical basics of technology and innovation management
... can name the tasks of technology and innovation management in companies
... know phase models (Design Thinking, Cross-Industry Innovation) for the successful generation of innovations
... can apply selected systematic methods of technology and innovation management in practice
... can create an innovation-friendly atmosphere in teams
... have gathered a mindset that promotes innovation
... can translate an innovation into a business model and market it
... have experienced the ups and downs of an innovation project with Design Thinking themselves

[*updated 04.02.2020*]

Module content:
1. Introduction to innvoation management
2. Introduction to Design Thinking
3. Disruption, structural and organizational aspects of innovation management
4. Design Thinking Phase 1: Inspiration
5. Deisgn Thinking Phase 2: Ideation
6. Deisgn Thinking Phase 3: Implementation
7. Basics of technology management

The course is supported by innovation labs and self-study phases in which students work on a design thinking project.

[*updated 12.06.2019*]

Teaching methods/Media:
Lectures with excercises
Innovation labs
Project work
Project reporting
Self-reflection

[*updated 04.02.2020*]

Additional information:
Disruption was voted "Economic Word of the Year" by the FAZ in 2015 and is associated with the fact that companies and business models that have been successful for decades suddenly have no more future. In the meantime, companies have realised that good ideas alone are not enough to be innovative and thus, successful in the long term. Ideas only become innovations when they turn into products or services that are successful on the market. This elective teaches how this works, which obstacles must be overcome and how innovations are created systematically.

Please register via the Moodle Learning Management System.

[*updated 04.02.2020*]

Recommended or required reading:
Vullings/Heleven: Not invented here - Cross-Industry-Innovation, BIS Publishers, 2015
Brown: Change by Design, HarperCollins
Bower/Christensen: Disruptive technologies - Catching the wave. in: Harvard Business Review, Jan/Feb 1995
Christensen: The Innovator´s Dilemma: When New Technologies Cause Great Firms to Fail (Management of Innovation and Change), Harvard Business Review Press, 2013
Ries: The Lean Startup: How Today´s Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses, Currency, 2011
Dark Horse Innovation: Digital Innovation Playbook, Murmann Publishers, 2017
Lewrick/Link/Leifer: The Design Thinking Playbook, Wiley, 2018

and additional reading material distributed during the course

[*updated 27.01.2020*]

Economic Foundations and the Political Framework of the German Energy Industry

Module name (EN): Economic Foundations and the Political Framework of the German Energy Industry
Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021
Module code: WIB21-WPM-W-403
Hours per semester week / Teaching method: 2V+2SU (4 hours per week)
ECTS credits: 5
Semester: according to optional course list
Mandatory course: no
Language of instruction: German
Assessment: Written exam and presentation [*updated 23.11.2020*]
Exam recurrence: The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).
Applicability / Curricular relevance: WIBASc-525-625-W13 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course, general subject WIB21-WPM-W-403 (P420-0400) Industrial Engineering, Bachelor, ASPO 01.10.2021 , optional course, general subject
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 150 hours (equivalent to 5 ECTS credits). There are therefore 105 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

[*updated 26.07.2023*]

Learning outcomes:
After successfully completing this module students will:
be able to assess and explain the economic and ecological significance of the energy industry within an economy.
be familiar with the scope and characteristics of the German energy industry.
be able to place key developments and problems in the energy industry in an overall context and critically analyze and evaluate them.
be able to independently develop solutions for selected problems in the energy industry
be able to independently analyze and deepen their knowledge about selected areas of the energy industry, as well as present their results.

[*updated 23.11.2020*]

Module content:
1. Introduction: Delimitations, basic terms and energy economics/statistics
2. Energy reserves and resources
3. Energy and environmental/climate protection
4. Energy scenarios
5. The petroleum industry
6. The coal industry (lignite and hard coal)
7. The gas industry
8. The electric power industry
9. Renewable energies in the power and heating sector
10. Energy efficiency

The presentations will focus on selected areas of the energy industry, often in connection with energy technology, regional energy structure policies and energy law. They will be related to current practical problems.

[*updated 23.11.2020*]

Teaching methods/Media:
Lecture with slides
Presentations with slides and subsequent discussions

[*updated 23.11.2020*]

Recommended or required reading:
The latest edition of the following literature will be used in this module:
Bundesnetzagentur/Bundeskartellamt: Monitoringbericht (jährlich) (engl. Monitoring report (annual))
Erdmann, Georg/Zweifel, Peter: Energieökonomik. Theorie und Anwendungen, Berlin/Heidelberg: Springer
Ströbele, Wolfang/Pfaffenberger, Wolfgang/Heuterkes. Michael: Energiewirtschaft: Einführung in Theorie und Politik. München: Oldenbourg
Schiffer, Hans-Wilhelm: Energiemarkt Deutschland, Köln: TÜV-Verlag GmbH

[*updated 23.11.2020*]

Electrical Engineering Practical Course

Module name (EN): Electrical Engineering Practical Course

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-T-108

Hours per semester week / Teaching method:
1P+1PA (2 hours per week)

ECTS credits:
3

Semester: according to optional course list

Mandatory course: no

Language of instruction:
German

Assessment:
Report

[*updated 02.12.2025*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-Ing25 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course, general subject
WIB21-WPM-T-108 (P450-0203) Industrial Engineering, Bachelor, ASPO 01.10.2021 , 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. Rudolf Friedrich

Lecturer: Prof. Dr. Rudolf Friedrich

[*updated 26.07.2023*]

Learning outcomes:
After successfully completing this module, students will be able to:
Independently set up and carry out practical experiments
Carry out scientific experiments
Represent the results of their experiments in an evaluation
Transform the theoretical electrical engineering knowledge they have gained so far into practical experiments and recognize and describe the analogies
Identify and apply appropriate solution methods
Work with the Com3Lab experimental environment from Leybold

[*updated 02.12.2025*]

Module content:
1. Direct current technology 1
   - 1.1 Circuitry
   - 1.2 Ohm s law
   - 1.3 Wheatstone bridge

2. Direct current technology 2
   - 2.1 Linear and nonlinear resistors
   - 2.2 Capacitor
   - 2.3 Inductance
   - 2.4 Force effect in a magnetic field

3. Alternating Current Technology 1
   - 3.1 Circuitry
   - 3.2 Transformer
   - 3.3 Diode
   - 3.4 Rectifier

4. Alternating Current Technology 2
   - 4.1 Capacitor
   - 4.2 Coil
   - 4.3 Ohmic resistance
   - 4.4 Circuitry of impedances

[*updated 02.12.2025*]

Teaching methods/Media:
Practical experiments with Leybold Com3Lab.

[*updated 02.12.2025*]

Recommended or required reading:
Leybold com3lab documentation
Electrical engineering lecture notes

[*updated 02.12.2025*]

Fluid Dynamics

Module name (EN): Fluid Dynamics
Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021
Module code: WIB21-WPM-T-101
Hours per semester week / Teaching method: 2V+2U (4 hours per week)
ECTS credits: 5
Semester: 5
Mandatory course: no
Language of instruction: English/German
Assessment: Written exam [*updated 14.03.2018*]
Exam recurrence: The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).
Applicability / Curricular relevance: WIBASc-525-625-Ing21 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course, general subject WIB21-WPM-T-101 (P450-0039) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 5, optional course, general subject Suitable for exchange students (learning agreement)
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 150 hours (equivalent to 5 ECTS credits). There are therefore 105 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 09.02.2022*]

Learning outcomes:
Topics:
After successfully completing this module, students will know the basics of classical fluid dynamics theory.
- Students will be able to plan an innovative aircraft geometry in teams
- The fluid flow simulation of the prototype will be done using the ANSYS Workbench (CFX)
- Students will be able to identify problems in this area and formulate tasks independently
- Students will have had their first introductory training in working with the 3D computational fluid dynamics program ANSYS Workbench (CFX)

The main goal of this module is to teach students to classify the costs and benefits of a commercial flow simulation and to successfully assign and delegate tasks.

[*updated 13.09.2018*]

Module content:
Group work in project teams:
- Definition of the project structure and roles
- Planning tasks

The classical flow theory:
- Presentation of different wing profiles (NACA)
- Profile flow
- Euler and Bernoulli equation
- Mass maintenance
- Impulse maintenance; Navier-Stokes equations
- Two equations turbulence models
- Loss calculation, flow breakage

Basics of the ANSYS Workbench (CFX):
- Creation of a parameterized flow geometry
- Discretization of the geometry with grating grids
- Numerical solution of partial differential equations
- Visualization and interpretation of 3D flow results
- Documentation of the simulation results (Excel, Powerpoint)

Practical work:
- Generation of a prototype with a 3-D printer
- Preparation of an experimental plan (DOE)
- Conducting pilot tests in the wind tunnel
- Documentation of test results (Excel, Powerpoint)

Presentation and discussion of the results in a lecture with the group

[*updated 14.03.2018*]

Teaching methods/Media:
- Lecture with beamer
- Implementation of practical flow simulations with the ANSYS Workbench (CFX)

- Supervised computer exercises in the PC pool
- Presentation of solutions for the other participants
- Creation of a PowerPoint presentations and youtube video dipicting the results obtained

[*updated 14.03.2018*]

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
- Chant, Christopher: "Flugzeug-Prototypen. Vom Senkrechtstarter zum Stealth-Bomber"; Stuttgart, Motorbuch, 1992
- Strybny, Jan: "Ohne Panik - Strömungsmechanik Lernbuch zur Prüfungsvorbereitung"; vieweg Verlag, 2003
- Siekmann, Helmut: "Strömungslehre - Grundlagen"; Springer Verlag, 2000
- Kalide, Wolfgang; "Einführung in die Technische Strömungslehre"; Hanser Verlag, 1984
- Bohl, Willi: "Technische Strömungslehre"; Vogel Buchverlag, 2002
- Noll, Berthold: "Numerische Strömungsmechanik - Grundlagen"; Springer-Verlag, 1993
- Spurk, Joseph H.: "Strömungslehre - Einführung in die Theorie und Praxis"; Springer-Verlag, 1992
- Sigloch, Herbert: "Technische Fluidmechanik"; Springer-Verlag, 2007

[*updated 14.03.2018*]

Fluid Energy Machines

Module name (EN): Fluid Energy Machines

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-T-102

Hours per semester week / Teaching method:
1V+1U (2 hours per week)

ECTS credits:
3

Semester: 5

Mandatory course: no

Language of instruction:
English

Assessment:
Written exam

[*updated 14.03.2018*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-Ing19 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course, general subject
WIB21-WPM-T-102 (P450-0040) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 5, optional course, general subject

Suitable for exchange students (learning agreement)

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. Frank Ulrich Rückert

Lecturer: Prof. Dr. Frank Ulrich Rückert

[*updated 09.02.2022*]

Learning outcomes:
After successfully completing this module, students will:
- understand the different types of fluid energy machines
- have achieved skills working with the program AMESim and modeling fluid energy machines
- have developed an AMESim model and be able to present their simulation results

[*updated 14.03.2018*]

Module content:
Content:
General principles of fluid energy machines:
- Classification of fluid energy machines
- Flow and displacement machines
- Definition of performance and efficiency

Simulation:
- Graphical programming of fluid energy machines with AMESim
- Modelling of cycle-processes in AMESim
- Comparison of different plant concepts

Fans, blowers and wind mills:
- Determination of flow
- Impeller and speed triangle
- Power transmission and the Euler equation

Water turbines:
- Overview of types
- Pelton turbine, Francis turbine and Kaplan turbine

Steam turbine and gas turbine:
- Steam power process, heat exchangers and nozzle design (stator)
- Gas turbine cycle, combustion chamber and heat transfer
- Operation and construction forms
- Degree of reaction
- Influence of number of blades and rotor design (diameter)

Pumps:
- Stroke piston pumps
- Pump control and parallel operation modes
- Pumps and circulation piston compressors
- Gear pumps

Thermal piston machines:
- One- and multistage compressors
- Steam engine
- Combustion engine

[*updated 13.09.2018*]

Teaching methods/Media:
Teaching methods and media:
- Lecture with video projector and whiteboard
- Simulation exercises in pc-pool with AMESim

[*updated 14.03.2018*]

Recommended or required reading:
- AMESim can be obtained by students free of charge from LMS (Siemens)

https://www.plm.automation.siemens.com/de_de/academic/resources/lms/amesim-student-registration.shtml

[*updated 14.03.2018*]

Holistic Production Systems and their Methods

Module name (EN): Holistic Production Systems and their Methods

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-I-707

Hours per semester week / Teaching method:
2V+1U+1P (4 hours per week)

ECTS credits:
5

Semester: 5

Mandatory course: no

Language of instruction:
German

Assessment:
Exam

[*updated 08.05.2023*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIB21-WPM-I-707 (P450-0046) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 5, optional course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
WIB21-450

[*updated 11.04.2024*]

Recommended as prerequisite for:

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

Lecturer:
Prof. Dr.-Ing. Dieter Arendes

[*updated 08.07.2022*]

Learning outcomes:
After successfully completing this module students will:
be able to explain and evaluate principles of holistic production systems
be able to describe and apply selected methods for error prevention and analysis
be able to apply selected holistic production system methods to optimize production processes
be able to design simple pull systems, especially with Kanban, Heijunka
be able to analyze and optimize processes, in particular production and set-up processes, with regard to holistic production system principles
be able to carry out value stream analyses with assistance
be able to explain the basic features of Six Sigma and apply selected tools
be able to apply the methods for decision analysis and problem solving according to Kepner/Tregoe

[*updated 08.05.2023*]

Module content:

Basics of production systems

Principles: pull principle, just in time, process orientation, transparency, flexibility (variants, quantities, life cycles) and Chaku Chaku lines

Methods: 5S, error prevention (Six Sigma, PokaYoke, ...), error analysis (5W, ...), problem analysis according to Kepner/Tregoe, continuous improvement, TPM, OEE, Kanban, Heijunka, SMED set-up, value stream analysis and design

[*updated 08.05.2023*]

Teaching methods/Media:
Lecture with exercises, as well as videos from teaching and industry.
Business games and exercises in the model factory or learning workshops
Lecture notes as a collection of slides, incl. questions and exercises.

[*updated 08.05.2023*]

Recommended or required reading:

Bertagnolli, F., Lean Management, Springer Gabler, 2018

Gorecki, P., Pautsch, P.:Praxisbuch Lean Management, Hanser Verlag, 2018

Dombrowski , U. / Mielke, T.: Ganzheitliche Produktionssysteme, VDI-Verlag, 2015

Erlach, K., Wertstromdesign: Der Weg zur schlanken Fabrik, Springer-Verlag Berlin Heidelberg, 2010

Brunner, F.J., Japanische Erfolgskonzepte, Hanser- Verlag, 2011 :

Dickmann, P., Schlanker Materialfluss, Springer-Verlag, 2007

Womack, J. P., Jones, D. T., Auf dem Weg zum perfekten Unternehmen, Heyne-Verlag, 1998

Eversheim, W., Gestaltung von Produktionssystemen, Springer-Verlag, 1999

[*updated 08.05.2023*]

International Project Week

Module name (EN): International Project Week

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-I-700

Hours per semester week / Teaching method:
2PA (2 hours per week)

ECTS credits:
2

Semester: 5

Mandatory course: no

Language of instruction:
English

Assessment:
Project with presentation, graded

[*updated 05.06.2025*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

EE-K2-538 Energy system technology / Renewable energies, Bachelor, ASPO 01.04.2015 , semester 5, optional course, engineering, course inactive since 14.03.2018
MAB.4.2.1.12 (P400-0002) Mechanical and Process Engineering, Bachelor, ASPO 01.10.2013 , semester 3, optional course
MST.IPW (P400-0002) Mechatronics and Sensor Technology, Bachelor, ASPO 01.10.2012 , optional course, non-technical, course inactive since 07.10.2015
MST.IPW (P400-0002) Mechatronics and Sensor Technology, Bachelor, ASPO 01.10.2019 , optional course, non-technical
MST.IPW (P400-0002) Mechatronics and Sensor Technology, Bachelor, ASPO 01.10.2020 , optional course, non-technical
PIBWN18 Applied Informatics, Bachelor, ASPO 01.10.2011 , semester 5, optional course, not informatics specific
WIBASc-525-625-FÜ31 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course, general subject
WIB21-WPM-I-700 (P400-0002) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 5, optional course, general subject
MST.IPW (P400-0002) Mechatronics and Sensor Technology, Bachelor, ASPO 01.10.2011 , optional course, non-technical, course inactive since 07.10.2015

Suitable for exchange students (learning agreement)

Workload:
30 class hours (= 22.5 clock hours) over a 15-week period.
The total student study time is 60 hours (equivalent to 2 ECTS credits).
There are therefore 37.5 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Marco Günther

Lecturer: Prof. Dr. Marco Günther

[*updated 09.02.2022*]

Learning outcomes:
During this module, students will practice:
- all phases of systematic product development and
- the presentation of their results in an oral presentation and a written report.

In a linguistically, socially, and geographically unfamiliar environment, students will learn how to
- solve a problem under pressure within a given time frame and collaboratively with other team members.
- work efficiently.
- recognize and use other team members skills and competence.
- stucture a task.
- assign subtasks to team members according to their skills.
- collect and evaluate information quickly.
- utilize the knowledge and skills of group members from other departments.
- being an effective member of a diverse group and learning about different methods and approaches.

[*updated 05.06.2025*]

Module content:
During this intensive project week, teams of up to seven international students from different universities, nationalities, degree programs, and semesters will work together at the htw saar or at one of our partner universities to solve a practical project task set by a company or an application-oriented research and development institute.

Based on the project task presented by a company representative, students will go through all the essential steps of product development:
- Developing ideas
- Evaluating ideas
- Developing a product

Students must present their final product design to the competing teams, professors, and company representatives. In addition to the presentation, they must also write a project report.

[*updated 05.06.2025*]

Teaching methods/Media:
Supervised project work

[*updated 10.11.2016*]

Recommended or required reading:
A reading list will be provided for each project group.

[*updated 13.09.2018*]

Introduction to Energy Technology

Module name (EN): Introduction to Energy Technology

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-T-105

Hours per semester week / Teaching method:
1V+1U (2 hours per week)

ECTS credits:
3

Semester: according to optional course list

Mandatory course: no

Language of instruction:
German

Assessment:
Written exam

[*updated 13.09.2018*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-Ing9 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course
WIB21-WPM-T-105 (P450-0023) Industrial Engineering, Bachelor, ASPO 01.10.2021 , 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. Rudolf Friedrich

Lecturer: Prof. Dr. Rudolf Friedrich

[*updated 26.07.2023*]

Learning outcomes:
After successfully completing this module, students will be acquainted with the actual energy conversion processes in power plants.
- They will be familiar with the different primary energy sources and can assess the environmental impacts and risks associated with their use.
- Students will be familiar with various power plant technologies in terms of design, function and operating performance.
- They will be able to assess the advantages and disadvantages of different types of power plants for different supply scenarios.
- Lastly, students will be able to characterize the different types of regenerative energies.

[*updated 13.09.2018*]

Module content:
1. General conditions in power plant technology
2. Energy conversion in power plants
3. Thermal power plants
a. Coal-fired plants
b. Nuclear power plants
4. Gas turbine and steam power plants
5. Fuel cells
6. Cogeneration plants
7. The basics of renewable energies

[*updated 13.09.2018*]

Teaching methods/Media:
Printed lecture notes (regularly revised), blackboard with additional practical examples;
Exercises based on technical case studies and planning tasks.

[*updated 13.09.2018*]

Recommended or required reading:
_ 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 13.09.2018*]

Investment Strategies

Module name (EN): Investment Strategies

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-W-405

Hours per semester week / Teaching method:
-

ECTS credits:
5

Semester: 6

Mandatory course: no

Language of instruction:
German

Assessment:

[*updated 23.09.2025*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIB21-WPM-W-405 (P450-0393) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 6, optional course

Workload:
The total student study time for this course is 150 hours.

Recommended prerequisites (modules):
WIB21-110 General Business Administration
WIB21-320

[*updated 10.07.2025*]

Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Stefan Georg

Lecturer: Prof. Dr. Stefan Georg

[*updated 12.01.2025*]

Learning outcomes:
After successfully completing this module, students will be able to:
- assess their prior knowledge themselves
- describe the most important investment strategies
- analyze and present selected investment strategies using scientific methods
- implement selected investment strategies using a model portfolio
- critically question and correct the effectiveness of their own investment decisions

[*updated 23.09.2025*]

Module content:
1. Self-reflection on personal requirements
2. Principles of investing: return, risk, diversification
3. Introduction to the most important investment strategies:
   Value investing
   Growth investing
   Dividend strategy
   Buy and hold strategy
   Momentum strategy
   Contrarian investing
   Index investing (passive)
   Core & satellite strategy

Absolute return strategy
ESG investing
Investing in precious metals
Investment in money market funds
Investment in penny stocks
Investment in niche markets
Investing in cryptocurrencies
Investment in commodities
4. Creating a model portfolio and justified selection of investment objects
5. Monitoring and correcting investment decisions
6. Reflecting on one´s own investment decisions

[*updated 23.09.2025*]

Teaching methods/Media:
Guided online course with specialized texts, a forum, and the opportunity to create a portfolio, as well as multiple face-to-face sessions for guidance and discussion of interim results.

[*updated 23.09.2025*]

Recommended or required reading:
Scientific and technical texts in the online course
Suitable financial websites for capital investment
Videos on capital investment from finanzfluss.de

[*updated 23.09.2025*]

Leadership and Team Management

Module name (EN): Leadership and Team Management

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-S-900

Hours per semester week / Teaching method:
2V+2U (4 hours per week)

ECTS credits:
5

Semester: 5

Mandatory course: no

Language of instruction:
English

Assessment:
Written exam (90 min) (80%), assignments in class (20%)

[*updated 16.10.2018*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-FÜ38 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course, general subject
WIB21-WPM-S-900 (P450-0064) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 5, optional course, general subject

Suitable for exchange students (learning agreement)

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Petra Garnjost

Lecturer: Prof. Dr. Petra Garnjost

[*updated 09.02.2022*]

Learning outcomes:
At the successful conclusion of this course the students will:
articulate the variables in successful and effective teams,
be able to identify dysfunctions in teams and provide solutions,
have an understanding of their roles and behavior in teams,
have knowledge of the building theories of leadership,
understand the role of leadership in the management process,
have knowledge of the skills, knowledge and attributes of successful leaders, as well as
an idea to improve and broaden their leadership skills.

[*updated 16.10.2018*]

Module content:
The course explores teamwork skills in work organizations and effective leadership behavior. Students will engage in the enhancement of their own skills in these areas combined with the study of empirical findings and classic and contemporary models of leadership and group dynamics.

Team Management
1. Team Analysis
2. Team Development
3. Decision Making in Teams
4. Negotiation and Conflict
5. Multicultural Teams

Leadership
1. Introduction to Leadership
2. History of Leadership
3. Emotional Intelligence
4. Transformational Leadership
5. Global Leadership

Individual leadership behavior
1. Self-Assessment
2. Personal Development Plan

[*updated 16.10.2018*]

Teaching methods/Media:
Material to prepare for class (videos, articles, presentations) will be available on Clix prior to each session. Various interactive methods are used in class (team exercises, presentations, case studies, group discussions, self-assessments)

[*updated 16.10.2018*]

Recommended or required reading:
Brett, J., Behfar, K., & Kern, M. C. (2009). Managing multicultural teams. The Essential Guide to Leadership, 85.
Collins, J. (2007). Level 5 leadership. The Jossey-Bass reader on educational leadership, 2, 27-50.
DuBrin, AJ., Leadership: Research findings, practice and skills (8 ed.). Cengage Learning, Boston, MA 2016. ISBN 978-1-285-86636-9
Eisenhardt, K. M., Kahwajy, J. L., & Bourgeois III, L. J. (2009). How management teams can have a good fight. Harvard Business Review Press.
Frisch, B. (2008). When teams can t decide. What Makes a Decisive Leadership Team, 2.
Goleman, D., Boyatzis, R. E., & McKee, A. (2013). Primal leadership: Unleashing the power of emotional intelligence. Harvard Business Press.
Kotter, J. P. (2007). What leaders really do. Harvard Business Review, 68(3).

[*updated 16.10.2018*]

Lean Startup

Module name (EN): Lean Startup

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-I-711

Hours per semester week / Teaching method:
2V+1SU+1U (4 hours per week)

ECTS credits:
5

Semester: 1

Mandatory course: no

Language of instruction:
German

Assessment:
Final report with presentation

[*updated 08.01.2024*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIB21-WPM-I-711 (P450-0387) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 1, optional course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Alexander Pöschl

Lecturer:
Prof. Dr. Alexander Pöschl

[*updated 30.10.2024*]

Learning outcomes:
After successfully completing this part of the module, students will have learned the Lean Startup method for validating business ideas and be able to apply it to practical problems. They will be able to evaluate innovations from a technical and entrepreneurial perspective and use suitable tools to implement and measure prototype solutions and draw conclusions for the following steps.

[*updated 08.01.2024*]

Module content:
1. Theoretical phase consisting of three workshops:
Workshop 1: Generating ideas, formulating assumptions, formulating tests/experiments, building (MVP/website, loading page, interviews, surveys...)
Workshop 2: Conducting experiments (data-oriented), metrics (vanity metrics vs. actionable/acessible/auditable metrics), formulating, collecting, evaluating key figures: split tests, cohorts, funnels, customer-related, AARRR framework with key figures
Workshop 3: Pivot or persevere, optimization or change of direction, changing experiments or hypotheses, deriving actions from experiments (e.g. on product features), if hypotheses are confirmed: Direction

customer creation, then company building
2. Practical phase: Implementation of the methods and procedures learned in the theoretical phase
3. Final event with documentation, presentation of results and derivation of next steps

[*updated 08.01.2024*]

Teaching methods/Media:
Lecture, group project, presentation

[*updated 08.01.2024*]

Recommended or required reading:
Ries, E. (2011). The lean startup: how today"s entrepreneurs use continuous innovation to create radically successful businesses. New York, Crown Business.
Blank, S. (2013). Why the lean start-up changes everything. Harvard Business Review, 91(5), 63-72.
Freiling, J. und Harima, J. (2019). Lean Startup, in: Entrepreneurship, Jörg Freiling und Jan Harima (Hrsg.), Springer Fachmedien, Wiesbaden.

[*updated 08.01.2024*]

Maintenance Planning

Module name (EN): Maintenance Planning

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-T-112

Hours per semester week / Teaching method:
1V+1U (2 hours per week)

ECTS credits:
3

Semester: 5

Mandatory course: no

Language of instruction:
German

Assessment:
Written exam

[*updated 02.12.2025*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIB21-WPM-T-112 (P450-0391) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 5, 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:
Studienleitung

Lecturer:
Torsten Schmidt

[*updated 10.10.2023*]

Learning outcomes:
After successfully completing this module, students will be able to:
answer questions about key terms and maintenance requirements
list the maintenance strategies and describe how they are implemented organizationally.
identify weaknesses based on key figures, take appropriate countermeasures, and estimate the costs involved.
apply this knowledge to a practical case involving an industry partner

[*updated 02.12.2025*]

Module content:
1. Basic maintenance terms
2. Tasks, maintenance requirements
3. Maintenance strategies
4. Vulnerability analysis
5. Budgeting for plant maintenance

[*updated 02.12.2025*]

Teaching methods/Media:
Regularly revised lecture notes will be passed out.

[*updated 13.09.2018*]

Recommended or required reading:
VDI-Richtlinien 3005
DIN 31051
Handbuch Instandhaltung, TÜV Rheinland
Eichler, C.: Instandhaltungstechnik, 5. Auflage, Verlag Technik / Huss Medi, 1998

[*updated 02.12.2025*]

Mathematics III

Module name (EN): Mathematics III

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-T-111

Hours per semester week / Teaching method:
2V+2U (4 hours per week)

ECTS credits:
5

Semester: according to optional course list

Mandatory course: no

Language of instruction:
German

Assessment:
Written exam

[*updated 13.09.2018*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-FÜ27 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course, technical
WIB21-WPM-T-111 (P450-0068) Industrial Engineering, Bachelor, ASPO 01.10.2021 , optional course, technical

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 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 26.07.2023*]

Learning outcomes:
After successfully completing this module, students will have a basic understanding of the higher mathematical methods presented in the course. They will have the skills necessary to
use these methods in real situations. Students will be able to analyze real problems with regard to the methods presented.
Number series, power series, function series (especially Fourier series) and Taylor series.

[*updated 13.09.2018*]

Module content:
Fourier and Laplace transform. Ordinary differential equations, mainly linear differential equations of the nth order and linear differential equation systems. Optional: higher-dimensional integration. Application of the above areas to technical and economic problems (based on examples).

[*updated 13.09.2018*]

Teaching methods/Media:
Lecture coupled with exercises. Media used: mainly blackboard and occasionally a projector (CAS calculations).

[*updated 13.09.2018*]

Recommended or required reading:
L. Papula: Mathematik für Ingenieure und Naturwissenschaftler Bände 1, 2 und 3
Fetzer/Fränkel: Mathematik Bände 2 und 3
H. Stöcker: Analysis für Ingenieurstudenten Band 2

[*updated 13.09.2018*]

Principles of Supply Networks and Systems

Module name (EN): Principles of Supply Networks and Systems

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-T-106

Hours per semester week / Teaching method:
1V+1U (2 hours per week)

ECTS credits:
3

Semester: according to optional course list

Mandatory course: no

Language of instruction:
German

Assessment:
Written exam

[*updated 02.07.2019*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-Ing10 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course
WIB21-WPM-T-106 (P450-0050) Industrial Engineering, Bachelor, ASPO 01.10.2021 , 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. Rudolf Friedrich

Lecturer: Prof. Dr. Rudolf Friedrich

[*updated 26.07.2023*]

Learning outcomes:
- After successfully completing this module, students will have basic technical knowledge about supply networks and _systems.
- They will be familiar with the structure, function and operating behavior of the equipment.
- They will be familiar with the internal structure of supply systems.
- They will be familiar with the interaction between the assets and the structure of the energy supply system.
- They will be able to technically evaluate network structures.
- They will have the theoretical basis for carrying out simple network planning.

[*updated 02.07.2019*]

Module content:
1. Gas, water, electricity supply
2. Electrical power supply
_ Electrical substations

_ Power stations
_ Power lines
_ Cables
3. Gas supply
_ Gas pressure regulating stations
_ Pipelines
_ Gas storage
4. Water supply
_ Water extraction
_ Water treatment and storage
_ Water distribution (pipe networks)
5. District heating supply

[*updated 02.07.2019*]

Teaching methods/Media:
Printed lecture notes (regularly revised), blackboard with additional practical examples;
exercises based on technical case studies and planning tasks.

[*updated 02.07.2019*]

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 02.07.2019*]

Procurement Management

Module name (EN): Procurement Management

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-I-708

Hours per semester week / Teaching method:
1V+1U (2 hours per week)

ECTS credits:
3

Semester: according to optional course list

Mandatory course: no

Language of instruction:
German

Assessment:
Written exam

[*updated 02.07.2019*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-FÜ3 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course
WIB21-WPM-I-708 Industrial Engineering, Bachelor, ASPO 01.10.2021 , 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:
Studienleitung

Lecturer: Studienleitung

[*updated 26.07.2023*]

Learning outcomes:
After successfully completing this module, students will be familiar with the tasks, forms and strategies of procurement. They will be able to determine procurement quantities and dates and select optimal procurement channels. Students will be familiar with the sub-processes of the purchasing process and can carry out supplier evaluations.

[*updated 02.07.2019*]

Module content:
Procurement Management
1. Procurement tasks
2. Procurement strategies and forms
3. Needs assessment process
4. Supplier selection
5. Order and contract types in purchasing
6. Goods receipt
7. Supplier evaluation
8. Supply Chain Management (SCM)

[*updated 02.07.2019*]

Teaching methods/Media:
Regularly revised lecture notes will be published for this course.

[*updated 02.07.2019*]

Recommended or required reading:

_ Arnold. U. / Kasulke, G.: Praxishandbuch Einkauf; 2003
_ Hirschsteiner, G.: Einkaufs- und Beschaffungsmanagement; 2. Auflage, Kiehl, 2006
_ Koppelmann, U.: Beschaffungsmarketing; 4. Auflage, Springer, 2003
_ Large, R.: Strategisches Beschaffungsmanagement; 4. Auflage, Gabler Verlag, 2009
_ Melzer _ Ridinger, R.: Beschaffung und Supply Chain Management; 2004
_ Preissner, A.: Electronic Procurement in der Praxis, Hanser Fachbuch, 2002
_ Altmeyer, D./ Georg, S.: Die Bedeutung von Wissensmanagement für Unternehmen, Shaker Verlag, 2002
_ Herbst, D.: Erfolgsfaktor Wissensmanagement, Cornelsen Verlag Scriptor, 2004
_ Probst, G. et al.: Wissen managen, 6. Auflage, Gabler Verlag, 2010
_ www.Wissensmanagement.net

[*updated 02.07.2019*]

Quality Techniques (Seminar, English)

Module name (EN): Quality Techniques (Seminar, English)

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-I-705

Hours per semester week / Teaching method:
2SU (2 hours per week)

ECTS credits:
3

Semester: 6

Mandatory course: no

Language of instruction:
English

Assessment:
Written composition with presentation

[*updated 14.03.2018*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme

(ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-Ing4 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 6, optional course
WIB21-WPM-I-705 (P450-0084) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 6, optional course

Suitable for exchange students (learning agreement)

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. Christoph Berger

Lecturer: Prof. Dr. Christoph Berger

[*updated 09.02.2022*]

Learning outcomes:
After successfully completing this module students will be able to:
_ independently research a technical subject using different quality techniques.
_ create an English-language documentation and presentation (assistance will be available at the beginning of the course) by themselves on a subject assigned to them.
_ demonstrate their communicative skills by presenting and discussing their subject in English in front of their fellow students and the lecturer.
_ follow and understand specialized lectures in English and solve problems by asking questions in English. In addition, they will have acquired a good overview of the various quality techniques.

[*updated 13.09.2018*]

Module content:
1. Basic tools
2. Preventative methods
3. Capability analyses incl. statistical principles
4. Inspection methods
5. Additional techniques

[*updated 13.09.2018*]

Teaching methods/Media:
Participants will receive a summary of each topic from their fellow classmates.
Presentations will be carried out using a laptop and projector.

[*updated 14.03.2018*]

Recommended or required reading:
_ Brunner, F.J./Wagner, K.W.: Taschenbuch Qualitätsmanagement, 4. Auflage, Carl Hanser Verlag, 2010
_ Kamiske: Qualitätstechniken für Ingenieure; Symposion Publishing; 2009
_ Linß : Qualitätsmanagement für Ingenieure; C. Hanser Verlag; 2011
_ Schmitt, R./Pfeifer, T.: Qualitätsmanagement, 4. Auflage, Carl Hanser Verlag, 2010
_ Theden, P./Colsman, H.: Qualitätstechniken, 4. Auflage, Carl Hanser Verlag, 2005
_ Zollondz, H.-D.: Grundlagen Qualitätsmanagement, 3. Auflage, Oldenbourg Wissenschaftsverlag, 2011

[*updated 14.03.2018*]

Research Seminar

Module name (EN): Research Seminar

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-I-702

Hours per semester week / Teaching method:
2SU+2S (4 hours per week)

ECTS credits:
5

Semester: 5

Mandatory course: no

Language of instruction:
English

Assessment:
Written composition with presentation

[*updated 14.03.2018*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-FÜ33 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course, general subject
WIB21-WPM-I-702 (P450-0086) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 5, optional course, general subject

Suitable for exchange students (learning agreement)

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 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. Christian Köhler

Lecturer: Prof. Dr.-Ing. Christian Köhler

[*updated 09.02.2022*]

Learning outcomes:

[*still undocumented*]

Module content:

[*still undocumented*]

Recommended or required reading:

[*still undocumented*]

Technical Sales and Distribution (Seminar)

Module name (EN): Technical Sales and Distribution (Seminar)

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-I-703

Hours per semester week / Teaching method:
1SU+1S (2 hours per week)

ECTS credits:
3

Semester: 6

Mandatory course: no

Language of instruction:
English

Assessment:
Term paper, presentation

[*updated 23.08.2018*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-W11 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 6, optional course, general subject
WIB21-WPM-I-703 (P450-0089) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 6, optional course, general subject

Suitable for exchange students (learning agreement)

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.-Ing. Christian Köhler

Lecturer: Prof. Dr.-Ing. Christian Köhler

[*updated 09.02.2022*]

Learning outcomes:
After successfully completing this module, students will have gained in-depth insight and practical experience in selected areas of technical sales and distribution, e.g. international & cross-cultural aspects of technical sales and distribution, impacts of digitalization, negotiation skills.

They will be familiar with effective meeting strategies and have improved their communication skills in sales situations.

Students will understand and be able to explain complex business contexts.

[*updated 13.09.2018*]

Module content:
Basics of technical sales and distribution (repetition)

Internationalization strategies and cultural differences
Personal appearance and skills in sales situations (meetings, product presentations, argumentation, negotiations etc.)
Impacts of digitalization (e.g. aspects of social media in B2B-markets)
Product management
Case studies
Project work

[*updated 13.09.2018*]

Teaching methods/Media:
Lectures, discussions, debates, group work, case studies

[*updated 14.03.2018*]

Recommended or required reading:
Care & Bohlig (2014): Mastering Technical Sales: The Sales Engineer´s Handbook, Artech House Publishing
Hollensen: Global Marketing, Pearson Education Limited
Brennan, Canning & McDowell: Business-to-Business Marketing, Sage Publishing

[*updated 13.09.2018*]

Thermal Energy Systems

Module name (EN): Thermal Energy Systems

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-T-116

Hours per semester week / Teaching method:
4VU (4 hours per week)

ECTS credits:
5

Semester: according to optional course list

Mandatory course: no

Language of instruction:
German

Assessment:
Written exam (50%,), term paper (50%)

[*updated 30.04.2025*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme

(ASPO).

Applicability / Curricular relevance:

WIB21-WPM-T-116 (P450-0394) Industrial Engineering, Bachelor, ASPO 01.10.2021 , optional course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 105 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 21.03.2025*]

Learning outcomes:
After successfully completing this module, students will be able to:
- analyze and evaluate transport and utilization concepts of thermal energy systems from a constructive, energetic and economic point of view
- plan and carry out analytical and model investigations
- evaluate the basic principles for the design and construction of important systems for electricity and heat generation (including gas turbines, boilers (hot water), heat pumps and chillers)

[*updated 30.04.2025*]

Module content:
- Extraction/production, processing and transportation of solids including biomass, liquids and gases
- Measurement and billing
- Fuel state
  - Standard and default state
  - Ideal and real behavior
  - Liquid, solid and gaseous fuels
- Fuel characteristics
- Calculation and determination of pressure losses, components and pipe network design
- Pipe network calculations
  - Determining peak delivery times
  - Fundamentals of fluid mechanics
  - Calculating pressure loss
  - Pipe networks
- Marketing and planning
- Emissions and immissions
- Laws and ordinances

[*updated 30.04.2025*]

Teaching methods/Media:
Lecture notes, lecture guide, exercises, collection of formulas

[*updated 30.04.2025*]

Recommended or required reading:
Zahoransky, Richard: Energietechnik, Springer Vieweg, (akt. Aufl.)

[*updated 30.04.2025*]

Using Mathematical Software

Module name (EN): Using Mathematical Software

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-T-110

Hours per semester week / Teaching method:
1V+1U (2 hours per week)

ECTS credits:
3

Semester: according to optional course list

Mandatory course: no

Language of instruction:
German

Assessment:
Written exam

[*updated 13.09.2018*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-FÜ12 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course
WIB21-WPM-T-110 (P450-0006) Industrial Engineering, Bachelor, ASPO 01.10.2021 , 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. Frank Kneip

Lecturer: Prof. Dr. Frank Kneip

[*updated 26.07.2023*]

Learning outcomes:
After successfully completing this module students will:
_ be able to model basic mathematical/technical problems and solve them with the help of a CAS (Computer Algebra System).
_ have a basic understanding of the general structure of common CAS such as Maple, Mathematica, etc.
_ have basic knowledge of how CAS libraries can be successfully used as tools.
_ have basic skills that can be used to present their results in an appealing and adequate form.
_ be capable of independently solving technical program problems using the program´s internal help systems.

[*updated 13.09.2018*]

Module content:
1. Introduction to principles and operation of computer algebra systems (CAS) (e.g. Mathematica, Mupad, Maple, Derive)
2. Realization of small projects in the fields of graphics, numerics, differential and integral calculus, linear algebra and stochastics
3. Principles of mathematical modelling
4. Case studies on mathematical modelling and its implementation with a CAS (e.g. Mathematica), e.g. on cryptography, curves and surfaces, differential equations, Monte Carlo methods

[*updated 13.09.2018*]

Teaching methods/Media:
The program packages Maple, Matlab will be used.

[*updated 13.09.2018*]

Recommended or required reading:

_ Barnes, G./ Fulford, G. R.: Mathematical Modelling with Case Studies; Crc Pr Inc, 2008
_ Basmadjian, D.: Mathematical Modeling of Physical Systems; Oxford University Press, 2003
_ Davis W. / Porta, H. / Uhl, J. J.: Calculus & Mathematica; Addison Wesley, 1994
_ Edwards, D. / Hamson, M.: Guide to Mathematical Modelling; Industrial Pr Inc, 2006
_ Hearn, D. D. / Baker, M. P. / Carithers, W.: Computer Graphics; Prentice Hall, 2010
_ Walz: Maple 7, Rechnen und Programmieren; Oldenbourg Wissenschaftsverlag, 2002
_ Kofler, M. / Bitsch, G. / Komma, M.: Maple: Einführung, Anwendung, Referenz; 5. Auflage, Addison-Wesley, 2002
_ Werner, W.: Mathematik lernen mit Maple 1; 2. Auflage, Dpunkt Verlag, 2001
_ Werner, W.: Mathematik lernen mit Maple 2, dpunkt Verlag, 1998
_ Fiume, E.: Scientific Computing; dpunkt Verlag, 1998

[*updated 13.09.2018*]

Valuation (English)

Module name (EN): Valuation (English)

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIB21-WPM-W-400

Hours per semester week / Teaching method:
1V+1U (2 hours per week)

ECTS credits:
3

Semester: 5

Mandatory course: no

Language of instruction:
English

Assessment:
Written exam

[*updated 14.03.2018*]

Exam recurrence:
The information regarding exam recurrence is found within the exam policy of the study programme (ASPO).

Applicability / Curricular relevance:

WIBASc-525-625-W7 Industrial Engineering, Bachelor, ASPO 01.10.2013 , semester 5, optional course
WIB21-WPM-W-400 (P450-0096) Industrial Engineering, Bachelor, ASPO 01.10.2021 , semester 5, optional course

Suitable for exchange students (learning agreement)

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 09.02.2022*]

Learning outcomes:
After successfully completing this module, students will have learned about and understand the different reasons for a business valuation. They will be familiar with the relevant valuation methods and the derivation of a risk-adjusted discount rate (portfolio selection, CAPM, debt policy, Modigliani-Miller)
They will understand the importance of an integrated corporate planning (P&L, cash flow and balance sheet) as a prerequisite for business valuation.
Students will be able to analyze, estimate and apply the typical paramaters of a valuation (Beta, risk premium, cash flow).
Students will be familiar with the highlights of German valuation standards (IDW S1, RS 10).

[*updated 13.09.2018*]

Module content:
A. Valuation as special case of capital budgeting
B. Reasons for valuation
C. Valuation methods
1. Asset value
2. Multiples
3. Net present value
4. DCF (Discounted Cashflow)
D. Procedure
1. Planning
i. Analysis of the past
ii. Validation of planning
2. Non-operation assets
3. Discount rate
iii. Portfolio Selection / CAPM
iv. Beta / Modigliani-Miller / Inflation
4. Taxes
5. Distinctions
E. Impairment test (IFRS)
F. Summary

[*updated 13.09.2018*]

Teaching methods/Media:
PowerPoint handout, case studies, Excel model

[*updated 14.03.2018*]

Recommended or required reading:
_ Brealey, R. / Myers, S. / Allen, F.: Principles of Corporate Finance, 10th edition, 2010
_ Copeland, Tom u.a.: Unternehmenswert; 3. Auflage, Campus Verlag, Frankfurt 2002
_ Damodaran, Aswath: Damodaran on Valuation; 2nd edition, John Wiley and Sons, New Jersey 2006
_ Drukarczyk, Jochen/Schüler, Andreas: Unternehmensbewertung; 6. Aufl., Vahlen, München 2009
_ Institut der Wirtschaftsprüfer: Grundsätze zur Durchführung von Unternehmensbewertungen (IDW Standard S1) i.d.F. vom 2.4.08.

[*updated 14.03.2018*]