Course Handbook Industrial Engineering Bachelor

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Industrial Engineering Bachelor - mandatory courses (overview)

Module name (EN)	Code	SAP-P	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator
Academic Work	WIBb21-370	P450-0346	3	15SU	2,5	Studienleitung
Accounting and Taxes	WIBb21-600	P450-0322	6	30VS	5	Studienleitung
Bachelor Thesis	WIBb21-890	T450-0151	8	-	12	Studienleitung
Basics of Mechatronics and Hydraulics	WIBb21-530	P450-0327	5	30VS	5	Studienleitung
Business Informatics	WIBb21-750	P450-0189	7	30SH	5	Studienleitung
Colloquium	WIBb21-895	S450-0166	8	-	3	Studienleitung
Cost Accounting and the Basics of Management Accounting	WIBb21-400	P450-0330	4	30VS	5	Studienleitung
Engineering Mechanics	WIBb21-340	P450-0344	3	30VS	5	Studienleitung
Environmental Management	WIBb21-850	P450-0186	8	30SH	5	Studienleitung
Investment and Financing	WIBb21-500	P450-0329	5	30VS	5	Studienleitung
Law	WIBb21-800	P450-0191	8	30VS	5	Studienleitung
Machine Elements and	WIBb21-440	P450-0334	4	30VS	5	Studienleitung

Module name (EN)	Code	SAP-P	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator
CAD						
Management and Leadership	WIBb21-700	P450-0332	7	30VS	5	Studienleitung
Marketing	WIBb21-710	P450-0333	7	15VS+15US	5	Studienleitung
Programming for Real-Time Systems	WIBb21-430	P450-0340	4	15VS+15US	5	Studienleitung
Quality Management	WIBb21-550	P450-0316	5	30VS	5	Studienleitung
Simulation	WIBb21-660	P450-0341	6	15VS+15US	5	Studienleitung
Statistics and Data Analysis	WIBb21-420	P450-0342	4	30VS	5	Studienleitung
Systems Engineering/ X in the Loop (HiL, SiL, MiL)	WIBb21-730	P450-0343	7	30PA	5	Studienleitung
Technische Production Planning	WIBb21-650	P450-0345	6	30VS	5	Studienleitung
Work Experience Phase II	WIBb21-380	P450-0175	3	4PA	5	Studienleitung
Work Experience Phase III	WIBb21-480	P450-0275	4	4PA	5	Studienleitung
Work Experience Phase IV	WIBb21-580	P450-0177	5	4PA	5	Studienleitung
Work Experience Phase V	WIBb21-680	P450-0178	6	4PA	5	Studienleitung
Work Experience Phase VI	WIBb21-780	P450-0179	7	4PA	5	Studienleitung

(25 modules)

Industrial Engineering Bachelor - optional courses (overview)

Module name (EN)	Code	SAP-P	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator

(0 modules)

Industrial Engineering Bachelor - mandatory courses

Academic Work

Module name (EN): Academic Work
Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021
Module code: WIBb21-370
Hours per semester week / Teaching method: 15SU (15 hours per week)
ECTS credits: 2,5
Semester: 3
Mandatory course: yes
Language of instruction: German
Assessment: Presentation [*updated 11.06.2025*]
Workload: 225 class hours (= 168.75 clock hours) over a 15-week period. The total student study time is 75 hours (equivalent to 2.5 ECTS credits). There are therefore -93.75 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): WIBb21-270

[*updated 12.11.2025*]

Recommended as prerequisite for:
WIBb21-700 Management and Leadership
WIBb21-890 Bachelor Thesis

[*updated 12.11.2025*]

Module coordinator:
Studienleitung

Lecturer:
Lehrbeauftragte der htw saar
Lehrbeauftragte
Professoren der Fakultät

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module students will:
- be able to familiarize themselves with a scientific topic, structure it in terms of time and content, and document their findings objectively and comprehensively.
- be able to implement procedures for systematic source searches, source evaluation, and source analysis, and systematically manage sources.
- be able to apply common citation techniques and rules of academic work.
- be able to present the findings of their paper in a concise and comprehensible manner in a short presentation and defend them in a subsequent discussion.
- be familiar with the consequences of plagiarism.

[*updated 11.06.2025*]

Module content:
- Introduction to academic work
- Things to do before you start
- Researching, evaluating, and managing sources
- Structuring the approach and the paper
- Layout of the paper
- Citation techniques
- Creating and presenting an academic paper

[*updated 11.06.2025*]

Teaching methods/Media:
Lectures, seminar-style teaching, digitally supported teaching,
self-study.

[*updated 11.06.2025*]

Recommended or required reading:
- Köhler, C. (2020): Basiswerkzeuge zur Erstellung wissenschaftlicher Arbeiten. Wiesbaden: Springer Gabler,

- Corsten, M. & Corsten, H. (2017): Schritt für Schritt zur Bachelorarbeit. München: Vahlen
- Theisen, M. R. (2013): Wissenschaftliches Arbeiten. 16. Auflage, München: Vahlen
- Ebster, C., & Stalzer, L. (2013): Wissenschaftliches Arbeiten für Wirtschafts- und Sozialwissenschaftler. 4. Auflage, Wien: UTB
- Currently valid guidelines for writing academic papers at the Business School

[*updated 11.06.2025*]

Accounting and Taxes

Module name (EN): Accounting and Taxes

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-600

Hours per semester week / Teaching method:
30VS (30 hours)

ECTS credits:
5

Semester: 6

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 11.06.2025*]

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

Recommended prerequisites (modules):
WIBb21-100
WIBb21-400 Cost Accounting and the Basics of Management Accounting
WIBb21-500 Investment and Financing

[*updated 12.11.2025*]

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer:
Lehrbeauftragte der htw saar

Lehrbeauftragte
Professoren der Fakultät

[*updated 12.11.2025*]

Learning outcomes:
Accounting:

After successfully completing this module, students will:
be able to apply basic knowledge of German accounting.
be able to explain the relationships between accounting, balance sheets, and profit and loss statements.
demonstrate understanding of when an asset/liability is recognized in the balance sheet and at what value.
be able to apply the knowledge acquired to perform an initial analysis of a set of annual financial statements.
be able to describe significant differences from international accounting standards and consolidated financial reporting.

Taxes:

After successfully completing this module, students will:
be able to work out questions regarding the characteristics and justification of the most important types of German taxes.
be able to calculate taxable income in tasks, depending on the type of tax.
be able to calculate personal income tax.
be able to identify the differences in taxation of individuals and corporations relevant to the task in question and calculate a comparison of tax burdens.
be able to deal with questions about basic knowledge of tax law (types of tax assessment).

[*updated 11.06.2025*]

Module content:
Accounting:

1. Principles of proper accounting
2. Do you balance?
3. Which value do you balance?
4. Where do you balance?
5. Structure of an earnings report
6. Notes
7. Main features of an annual account policy and analysis
8. Main features of consolidated accounting and international accounting

Taxes:

1. Overview of the German tax system
2. Income tax
3. Corporate tax
4. Trade tax
5. Inheritance/gift tax
6. Property tax
7. Value added tax
8. Other tax types
9. Tax burden comparison

[*updated 11.06.2025*]

Teaching methods/Media:
Lecture, digitally supported teaching, self-study

[*updated 11.06.2025*]

Recommended or required reading:
Accounting:

Baetge, Jörg; Kirsch, Hans-Jürgen; Thiele, Stefan: Bilanzen, aktuelle Auflage
Bieg, Hartmut; Kussmaul, Heinz: Externes Rechnungswesen, aktuelle Auflage
Federmann, Rudolf: Bilanzierung nach Handelsrecht, Steuerrecht und IAS/IFRS, aktuelle Auflage
Wöhe, Günter/Kußmaul, Heinz: Grundzüge der Buchführung und Bilanztechnik, aktuelle Auflage

Taxes:

Haberstock, L./Breithecker, V.: Einführung in die Betriebswirtschaftliche Steuerlehre, aktuelle Auflage
Kußmaul, Heinz: Betriebswirtschaftliche Steuerlehre, aktuelle Auflage
Watrin, C./ Rose, G.: Betrieb und Steuer, 1. Buch: Ertragsteuern: Einkommensteuer, Körperschaftsteuer, Gewerbesteuer, aktuelle Auflage
Wöhe, G./Döring, U.: Einführung in die Allgemeine Betriebswirtschaftslehre, aktuelle Auflage

[*updated 11.06.2025*]

Bachelor Thesis

Module name (EN): Bachelor Thesis

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-890

Hours per semester week / Teaching method:
-

ECTS credits:
12

Semester: 8

Mandatory course: yes

Language of instruction:
German

Assessment:
Thesis

[*updated 11.06.2025*]

Workload:
The total student study time for this course is 360 hours.

Recommended prerequisites (modules):
WIBb21-150
WIBb21-370 Academic Work

[*updated 12.11.2025*]

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer:
Professoren der Fakultät

[*updated 12.11.2025*]

Learning outcomes:
The Bachelor s Thesis´s thesis is a written final thesis. By completing their thesis, students demonstrate that they are able to:
work independently, using scientific methods, to solve an industrial engineering problem within a specified time frame (usually three months).
collect information on the current state of research related to their topic as independently as possible, collect and evaluate data on their research topic, and draw conclusions from the results.
apply the knowledge and skills they have acquired to find a solution and develop those skills independently
to arrive at a suitable solution.
explain their approach and discuss how they arrived at a solution strategy.

[*updated 11.06.2025*]

Module content:
Content will may vary depending on the respective topic. However, students must do justice to the contents of an industrial engineering course of study.

Students results will be presented and evaluated in a colloquium with regard to their problems and the solutions found (see corresponding module description).

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

[*updated 11.06.2025*]

Recommended or required reading:
The literature will vary depending on the topic.

[*updated 11.06.2025*]

Basics of Mechatronics and Hydraulics

Module name (EN): Basics of Mechatronics and Hydraulics

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-530

Hours per semester week / Teaching method:
30VS (30 hours)

ECTS credits:
5

Semester: 5

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 11.06.2025*]

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

Recommended prerequisites (modules):
WIBb21-120
WIBb21-220
WIBb21-320
WIBb21-330
WIBb21-340 Engineering Mechanics

[*updated 12.11.2025*]

Recommended as prerequisite for:
WIBb21-630
WIBb21-660 Simulation
WIBb21-730 Systems Engineering/ X in the Loop (HiL, SiL, MiL)

[*updated 19.11.2025*]

Module coordinator:
Studienleitung

Lecturer:
Prof. Dr. Frank Kneip

Professor/innen des Studiengangs

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module, students will:
be able to describe various sensors and their operating principles as well as their advantages and disadvantages.
be able to describe various actuators and their operating principles as well as their advantages and disadvantages.
be able to describe various hydraulic components and their operating principles as well as their advantages and disadvantages.
be able to read and create hydraulic circuit diagrams.
be able to select the appropriate components mentioned above for the construction of such a system based on the relevant requirements for a system and justify their selection.

[*updated 11.06.2025*]

Module content:
1. Sensors
   - 1.1 Basic principles
   - 1.2 Analysis of selected sensors (operating principle, advantages and disadvantages)
   - 1.3 Use in systems and installations

2. Actuators
   - 2.1 Basic principles
   - 2.2 Analysis of selected actuators (operating principle, advantages and disadvantages)
   - 2.3 Use in systems and installations

3. Hydraulic components
   - 3.1 Basic principles
   - 3.2 Analysis of selected hydraulic components (operating principle, advantages and disadvantages)
   - 3.3 Hydraulic circuit diagrams
   - 3.4 Use in systems and installations

[*updated 11.06.2025*]

Teaching methods/Media:
Lecture, digitally supported teaching, self-study

[*updated 11.06.2025*]

Recommended or required reading:
Roddeck, W.: Einführung in die Mechatronik; 4. Auflage, Vieweg+Teubner Verlag, 2012

Lunze, J.: Regelungstechnik 1; 9. Auflage, Springer Verlag, 2013
Unbehauen, H.: Regelungstechnik 1; 15. Auflage, Vieweg+Teubner Verlag, 2008
Reuter, M., Zacher, S.: Regelungstechnik für Ingenieure; 12. Auflage, Vieweg+Teubner Verlag, 2008
Tröster, F.: Steuerungs- und Regelungstechnik für Ingenieure; 3. Auflage, Oldenbourg Verlag, 2011

[*updated 11.06.2025*]

Business Informatics

Module name (EN): Business Informatics

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-750

Hours per semester week / Teaching method:
30SH (30 hours)

ECTS credits:
5

Semester: 7

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 11.06.2025*]

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

Recommended prerequisites (modules):
WIBb21-230

[*updated 19.11.2025*]

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer:
Lehrbeauftragte der htw saar
Lehrbeauftragte
Professoren der Fakultät

[*updated 19.11.2025*]

Learning outcomes:
After successfully completing this module students will:

be able to outline the basic subject areas of business informatics

be able to describe how business informatics is connected to related disciplines
be able to explain and classify the embedding of IT systems in an organization, its technology and with regard to a company s strategic goals
be able to visualize processes by means of common notations and classify these notations with regard to their intended use
be familiar with the basic types of applications,
as well as database systems and ERP.
be able to explain decision support systems, workflow and information management systems and differentiate between their applications.

[*updated 11.06.2025*]

Module content:
1. Purpose and function of information systems
2. History of business informatics
3. Database systems and data organization
4. Enterprise resource planning systems
5. Business process management tools
6. Modeling processes
7. Analytical information systems
8. Current trends

[*updated 11.06.2025*]

Teaching methods/Media:
Lectures, seminar-style teaching, digitally supported teaching, self-study

[*updated 11.06.2025*]

Recommended or required reading:
Laudon, K. C.; Laudon, J. P.; Schoder, D.: Wirtschaftsinformatik, 2. Auflage, Pearson Studium Verlag, 2009
Thome, R.: Grundzüge der Wirtschaftsinformatik: Integration der Informationsverarbeitung in die Organisation von Unternehmen. Pearson Studium Verlag, 1. Auflage, 2006.
Abts, D.; Mülder, W.: Grundkurs Wirtschaftsinformatik: Eine kompakte und praxisorientierte Einführung, Vieweg+Teubner Verlag; 7. Auflage, 2011.
Scheer, A. W.: Wirtschaftsinformatik Studienausgabe; 2. Auflage, Springer Verlag, 1998
Scheer, A.-W.: Wirtschaftsinformatik Referenzmodelle für industrielle Geschäftsprozesse, 7. Auflage, Springer Verlag, 1997

[*updated 11.06.2025*]

Colloquium

Module name (EN): Colloquium

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-895

Hours per semester week / Teaching method:

-

ECTS credits:
3

Semester: 8

Mandatory course: yes

Language of instruction:
German

Assessment:
Presentation

[*updated 11.06.2025*]

Workload:
The total student study time for this course is 90 hours.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer:
Professoren der Fakultät

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module, students will:

be able to present the essential content and findings on a scientific topic (in this case, their thesis) independently and in a structured manner
be able to defend their economic approach to the given issue and justify their decisions and assessments in a presentation/discussion

[*updated 11.06.2025*]

Module content:
1. In a short presentation, students will explain the content, objectives, and results of their theses. They will outline the course of their academic study and explain their chosen approach.

2. In principle, the colloquium is held as an open event, so that, among other things, representatives of the companies that made it possible for the student to work on their Bachelor topic, but also representatives of the press, can participate in it. In this way, the industrial engineering group can also contribute to the public

debate. The colloquium can also take place in the company that selected the topic of the Bachelor thesis.

3. The content of the students presentations depends on the topic of the thesis.

[*updated 11.06.2025*]

Recommended or required reading:

[*updated 11.06.2025*]

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: WIBb21-400

Hours per semester week / Teaching method:
30VS (30 hours)

ECTS credits:
5

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 18.06.2025*]

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

Recommended prerequisites (modules):
WIBb21-100

[*updated 12.11.2025*]

Recommended as prerequisite for:
WIBb21-600 Accounting and Taxes
WIBb21-650 Technische Production Planning

[*updated 12.11.2025*]

Module coordinator:
Studienleitung

Lecturer:
Prof. Dr. Stefan Georg
Alexander Hamman, M.Sc.

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module, students will:
be able to solve and describe 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 18.06.2025*]

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 18.06.2025*]

Teaching methods/Media:
Lecture, digitally supported teaching, self-study

[*updated 18.06.2025*]

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 18.06.2025*]

Engineering Mechanics

Module name (EN): Engineering Mechanics
Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021
Module code: WIBb21-340
Hours per semester week / Teaching method: 30VS (30 hours)
ECTS credits: 5
Semester: 3
Mandatory course: yes
Language of instruction: German
Assessment: Exam [*updated 11.06.2025*]
Workload: The total student study time for this course is 150 hours.
Recommended prerequisites (modules): WIBb21-120 [*updated 12.11.2025*]
Recommended as prerequisite for: WIBb21-530 Basics of Mechatronics and Hydraulics WIBb21-540 WIBb21-730 Systems Engineering/ X in the Loop (HiL, SiL, MiL) [*updated 12.11.2025*]
Module coordinator: Studienleitung
Lecturer: Lehrbeauftragte der htw saar Professor/innen des Studiengangs [*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module students will:

be able to recognize forces and force effects and represent them both in graphs and mathematically.

be able to derive equilibrium conditions and determine bearing forces and moments.

be able to determine the internal force and moment effects for given external forces.

know the physical principles of friction and be able to determine under which conditions a system with frictional forces is stable.

[*updated 11.06.2025*]

Module content:
Statics:
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 11.06.2025*]

Teaching methods/Media:
Lectures, digitally supported teaching,
self-study.

[*updated 11.06.2025*]

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 11.06.2025*]

Environmental Management

Module name (EN): Environmental Management

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-850

Hours per semester week / Teaching method:
30SH (30 hours)

ECTS credits:
5

Semester: 8

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 11.06.2025*]

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

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer:
Alexander Hamman, M.Sc.
Professoren der Fakultät

[*updated 19.11.2025*]

Learning outcomes:
After successfully completing this module, students will:
be familiar with the concepts, instruments, and practical applications of corporate environmental management.

They will be able to quickly familiarize themselves with this field within a company and carry out the corresponding tasks.

And they will be familiar with specific rules and regulations.

[*updated 11.06.2025*]

Module content:
1. Principles of environmental management

2. Company life cycle assessments and environmental management systems (ISO 14001; EMAS-VO)
3. Life cycle assessment and product life cycle assessment
4. Integrated management systems (quality and occupational safety)
5. Environmental Law (focus on waste law) / Commissioners / EU directives
6. Operational material flow and waste management (waste concepts, material flow management, waste logistics, residual materials ordinance, recycling packaging ordinance, electronic waste ordinance, company representative)

[*updated 11.06.2025*]

Teaching methods/Media:
Lectures, seminar-style teaching, digitally supported teaching, self-study

[*updated 11.06.2025*]

Recommended or required reading:
Handbuch Umweltcontrolling, Herausgeber Bundesumweltministerium und Umweltbundesamt, Verlag Franz Vahl, München, 2001
Baumast, A./Papa, J.: Betriebliches Umweltmanagement, 4. Auflage, Verlag Eugen Ulmer, 2009
Schmid, D.: Qualitätsmanagement: Arbeitsschutz und Umweltmanagement, 4. Auflage, Europa Lehrmittel, 2012
Beckmann, M.: Abfallrecht, 16. Auflage, DTV, 2012

[*updated 11.06.2025*]

Investment and Financing

Module name (EN): Investment and Financing

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-500

Hours per semester week / Teaching method:
30VS (30 hours)

ECTS credits:
5

Semester: 5

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 18.06.2025*]

Workload:

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

Recommended prerequisites (modules):
WIBb21-100

[*updated 17.11.2025*]

Recommended as prerequisite for:
WIBb21-600 Accounting and Taxes
WIBb21-650 Technische Production Planning

[*updated 12.11.2025*]

Module coordinator:
Studienleitung

Lecturer:
Prof. Dr. Stefan Georg
Lehrbeauftragte der htw saar
Lehrbeauftragte
Professoren der Fakultät

[*updated 17.11.2025*]

Learning outcomes:
Investment:
After successfully completing this module, students will:
have a broad overview of the financially effective decision-making processes in companies.
be able to explain the reasons for financing and investment transactions and the periodization of incoming and outgoing payment series
be able to implement common methods of static and dynamic investment appraisal procedures as well as other procedures (taking into account taxes, useful life, uncertainty) and apply them appropriately to operational decision-making situations
be able to compare advantageousness based on the respective prerequisites and conditions of use

Financing:
After successfully completing this module, students will:
be able to present a broad overview of the financial decision-making factors in companies
be able to compare advantageousness based on the respective prerequisites and conditions of use
be able to name the most important instruments of external and internal financing
depending on the maturity, they will be able to tap suitable sources of equity or external financing and select them according to the situation.
be able to apply their knowledge of legal and tax structuring options and confidently make financing decisions in standard business situations

[*updated 18.06.2025*]

Module content:
Investment:
1. Preliminary remarks

1.1 Terms
1.2 Financial decision criteria

2. Static investment calculation methods
   2.1 Common characteristics of static methods
   2.2 Cost comparison calculation
   2.3 Profit comparison calculation
   2.4 Profitability calculation
   2.5 Static amortization calculation

3. Dynamic investment calculation methods
   3.1 Principles of financial mathematics
   3.2 Common characteristics of dynamic methods
   3.3 Net present value (NPV) method
   3.4 Annuity method
   3.5 Internal rate of return (IRR)
   3.6 Dynamic amortization calculation

4. Selected dynamic calculation methods
   4.1 Compound methods
   4.2 Determining the optimum life/the optimal replacement cycle
   4.3 Consideration of taxes/depreciation of money in preinvestment analysis
   4.4 Consideration of uncertainty

Financing:
1. Basic financial principles

2. Debt financing
   2.1 Self-financing
      2.1.1 of companies without access to the stock exchange
      2.1.2 of companies with access to the stock exchange
   2.2 External financing
      2.2.1 Long-term external financing
      2.2.2 Short-term external financing
   2.3 Special forms
   2.4 Derivative forms of equity and debt financing

3. Internal financing
   3.1 Self-financing
   3.2 Financing from depreciation and provisions
   3.3 Financial planning and determining capital requirements
   3.4 Financial analysis

The theoretical aspects of all topics will be presented and practiced in numerous exercises.

[*updated 18.06.2025*]

Teaching methods/Media:
Lecture, digitally supported teaching, self-study

[*updated 18.06.2025*]

Recommended or required reading:
Investment:

Bieg, Hartmut/Kußmaul, Heinz: Investition, aktuelle Auflage
Blohm, Hans; Lüder, Klaus; Schäfer, Christina: Investition, aktuelle Auflage
Kußmaul, Heinz: Betriebswirtschaftslehre für Existenzgründer, aktuelle Auflage
Olfert, K./Reichel, C.: Investition, aktuelle Auflage
Perridon, L./Steiner, M./Rathgeber, A.: Finanzwirtschaft der Unternehmung, aktuelle Auflage

Financing:
Bieg, Hartmut/Kußmaul, Heinz: Finanzierung, aktuelle Auflage
Hirth, H.: Grundzüge der Finanzierung und Investition, aktuelle Auflage
Kruschwitz, L./Husmann, S.: Finanzierung und Investition, aktuelle Auflage
Olfert, K.: Finanzierung, aktuelle Auflage

[*updated 18.06.2025*]

Law

Module name (EN): Law

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-800

Hours per semester week / Teaching method:
30VS (30 hours)

ECTS credits:
5

Semester: 8

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 11.06.2025*]

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

Recommended prerequisites (modules):
WIBb21-100

[*updated 12.11.2025*]

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer:
Lehrbeauftragte der htw saar
Lehrbeauftragte
Professoren der Fakultät

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module students will:
be familiar with the most important basics of German commercial private law for industrial engineers
understand the function and mechanisms of civil law
be able to apply legal texts independently, interpret each regulation and relate them to one another
be able to understand the relevance of regulations for operational practice
be able to develop solutions for specific cases by classifying the problem, subsuming the facts under the characteristics of the relevant regulations and deriving the result from them
be able to review the results based on general legal value judgements.

[*updated 11.06.2025*]

Module content:
1. Basic concepts of the legal system
2. Contract and contractual freedom as central elements of legal transactions between companies
3. Concluding contracts (e.g. contractual obligations and transfer of ownership, form, representation); principles of GTC law
4. Fulfilment of contracts and defective performance
5. Important types of contracts in the manufacturing industry (purchase contract, contract for work and services)
6. Commercial law (commercial register, merchants, companies, commercial law representatives, commercial transactions in the manufacturing industry) and corporate law (partnerships and corporations)

[*updated 11.06.2025*]

Teaching methods/Media:
Lecture, digitally supported teaching, self-study

[*updated 11.06.2025*]

Recommended or required reading:
Ann, C., Hauck, R.& Obergfell, E. I.: Wirtschaftsprivatrecht kompakt, Vahlen München, aktuelle Auflage
Führich, E.: Wirtschaftsprivatrecht, Vahlen, München, aktuelle Auflage
Schade, L.: Handels- und Gesellschaftsrecht, C.F. Müller. Heidelberg, aktuelle Auflage
Führich, E. & Werdan, I.: Wirtschaftsprivatrecht in Fällen und Fragen, Vahlen, München, aktuelle Auflage
Kallwass, P. & Abels, P.: Privatrecht, Vahlen, München, aktuelle Auflage
Klunzinger, E.: Übungen im Privatrecht, Vahlen München, aktuelle Auflage

[*updated 11.06.2025*]

Machine Elements and CAD

Module name (EN): Machine Elements and CAD

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-440

Hours per semester week / Teaching method:
30VS (30 hours)

ECTS credits:
5

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 18.06.2025*]

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

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:
WIBb21-540
WIBb21-650 Technische Production Planning
WIBb21-730 Systems Engineering/ X in the Loop (HiL, SiL, MiL)

[*updated 12.11.2025*]

Module coordinator:
Studienleitung

Lecturer:
Prof. Dr. Dirk Hübner
Professor/innen des Studiengangs

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module students will:

be familiar with structural design methodology and technology
be proficient in the calculation of selected machine elements
be able to read technical drawings
be proficient in drawing and dimensioning simple technical components with CAD
be able to name the properties and areas of application of important machine elements

[*updated 18.06.2025*]

Module content:
1. Introduction, design principles and methodology
2. Standards, tolerances and fits, surfaces
3. Reading technical drawings
4. Introduction to CAD
5. Strength calculations on shafts and axles
6. Overview of properties, areas of application and calculation bases of selected machine elements: shaft-hub connections, screws, springs

[*updated 18.06.2025*]

Teaching methods/Media:
Lecture, digitally supported teaching, self-study

[*updated 18.06.2025*]

Recommended or required reading:
Muhs, D./ Wittel, H./ Becker, M./ Jannasch, D./ Voßiek, J./ Roloff/ Matek: Maschinenelemente,20. Auflage, Vieweg+Teubner Verlag, 2011
Grote, K.-H-; Feldhusen, J.: Dubbel: Taschenbuch für den Maschinenbau, Springer Berlin Heidelberg, 2011
Decker, K.-H-; Kabus, K.: Maschinenelemente, 18. Auflage, Hanser Fachbuchverlag, 2011
Hesser, W.; Hoischen, H.: Technisches Zeichnen: Grundlagen, Normen, Beispiele, Darstellende Geometrie,
Cornelsen Verlag, 2011

[*updated 18.06.2025*]

Management and Leadership

Module name (EN): Management and Leadership

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-700

Hours per semester week / Teaching method:
30VS (30 hours)

ECTS credits:
5

Semester: 7

Mandatory course: yes

Language of instruction:
German

Assessment:
Written composition with presentation

[*updated 18.06.2025*]

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

Recommended prerequisites (modules):
WIBb21-100
WIBb21-300
WIBb21-370 Academic Work

[*updated 12.11.2025*]

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer:
Prof. Dr. Wolfgang Appel

[*updated 12.11.2025*]

Learning outcomes:
After taking part in the Management and Leadership module, students will be able to,

identify and evaluate potential and challenges regarding the management of companies,
understand and systematize the complexity of strategic management of companies,
to analyze and assess the relevant framework conditions of company management,
explain management theories and apply them to practical business examples,
characterize and analyze corporate strategies at different levels,
identify different options with regard to the structures of companies,
make decisions in uncertain situations in a structured and confident manner,
solve leadership problems practically.

[*updated 18.06.2025*]

Module content:
Dynamics of global competition
Basic concepts and theoretical framework of corporate management
Normative corporate management
Business environment analysis
Market-oriented corporate management

Resource-oriented corporate management
Value-oriented corporate management
Change management
Planning and control
Organization and personnel management
Process management and project management
Information and knowledge management

[*updated 18.06.2025*]

Teaching methods/Media:
Lecture, digitally supported teaching, self-study

[*updated 18.06.2025*]

Recommended or required reading:
Dillerup, Stoi: Unternehmensführung, 2. Aufl. 2010
Macharzina, Wolf: Unternehmensführung, 5. Aufl. 2005
Schreyögg: Organisation: Grundlagen moderner Organisationsgestaltung, 5. Aufl. 2008.
Stähle: Management: Eine verhaltenswissenschaftliche Perspektive, 8. Auflage 1999
Welge, Al-Laham: Strategisches Management. Grundlagen - Prozess Implementierung, 4. Aufl.,2003.

[*updated 18.06.2025*]

Marketing

Module name (EN): Marketing

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-710

Hours per semester week / Teaching method:
15VS+15US (30 hours)

ECTS credits:
5

Semester: 7

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 18.06.2025*]

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

Recommended prerequisites (modules):
WIBb21-100

[*updated 19.11.2025*]

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer:
Lehrbeauftragte der htw saar
Lehrbeauftragte
Professoren der Fakultät

[*updated 19.11.2025*]

Learning outcomes:
After successfully completing this module, students will be able to classify marketing as a cross-functional business concept that ensures long-term business security. They will be familiar with the basic principles and objectives of marketing as well as its various areas. They will be able to demonstrate basic knowledge of the four instruments of the marketing mix and explain how they are interrelated.

In a practical component, students will independently develop a strategic/operational marketing plan within the framework of the marketing management process in a real-world case study, applying the knowledge they have acquired in theory.

[*updated 18.06.2025*]

Module content:
Marketing basics:

Marketing development stages
The principle of marketing
Core marketing concepts and terms
Building blocks of a marketing concept:

- Requirements, preferences, and demand
- Offers (products, services, and experiences)
- Customer benefits and satisfaction
- Exchange, transaction, and relationships
- Markets

Purchasing decision process
Marketing perspective
Marketing as a management task: The management process
Marketing environment: Factors influencing marketing decisions

Market segmentation:

Principle and benefits of market segmentation

Market segmentation as the basis for further marketing steps

Marketing strategies:

Strategic corporate planning
Strategic marketing planning
Strategic analysis methods:

- SWOT analysis
- Portfolio analysis
- Product-market matrix
- Competitive strategies according to Porter (??)
- Experience curve (??)
- Product life cycle

Marketing tools - the marketing mix

Basics:

- Product policy
- Pricing policy
- Distribution policy
- Communication policy

[*updated 18.06.2025*]

Teaching methods/Media:
Lectures, seminar-style teaching, digitally supported teaching, self-study

[*updated 18.06.2025*]

Recommended or required reading:
- Kotler, P. et al (aktuelle Auflage): Grundlagen des Marketing, München: Pearson Studium
- Walsh, G., Deseniss, A., Kilian, Th. (aktuelle Auflage): Marketing, Eine Einführung auf der Grundlage von Case Studies, Berlin: Springer Gabler
- Meffert, H. et al. (aktuelle Auflage): Marketing. Grundlagen marktorientierter Unternehmensführung. Wiesbaden: Gabler.
- Esch, F.-R., Herrmann A., Sattler H. (aktuelle Auflage): Marketing, München: Vahlen

[*updated 18.06.2025*]

Programming for Real-Time Systems

Module name (EN): Programming for Real-Time Systems

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-430

Hours per semester week / Teaching method:
15VS+15US (30 hours)

ECTS credits:
5

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:
Project work

[*updated 11.06.2025*]

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

Recommended prerequisites (modules):
WIBb21-230

[*updated 19.11.2025*]

Recommended as prerequisite for:
WIBb21-630
WIBb21-730 Systems Engineering/ X in the Loop (HiL, SiL, MiL)

[*updated 12.11.2025*]

Module coordinator:
Studienleitung

Lecturer:
Lehrbeauftragte der htw saar
Lehrbeauftragte
Professor/innen des Studiengangs

[*updated 19.11.2025*]

Learning outcomes:
After successfully completing this course, students will be able to:

- use the Arduino IDE (Integrated Development Environment) to program a microcontroller (Arduino).

- illustrate the differences between an implementation for microcontroller-based systems and an offline implementation.

- design a flowchart for the microcontroller-based system.

- implement code for the Arduino based on a given flowchart.

- integrate selected sensors and actuators using the microcontroller.

[*updated 11.06.2025*]

Module content:
Students will learn the basics of Arduino boards and related components (e.g., plug-in boards).

Students will receive an introduction to programming a microcontroller (e.g., Arduino Uno) and integrating sensors and actuators for interaction with the physical environment.

We will discuss the differences between implementation for microcontroller-based systems and offline implementation.

The module also covers the design of a flowchart for the microcontroller-based system and the implementation of code for Arduino based on a given flowchart.

[*updated 11.06.2025*]

Teaching methods/Media:
Lectures, digitally supported teaching, workshop project, self-study

[*updated 11.06.2025*]

Recommended or required reading:
Literature references will be provided during the lecture.

[*updated 11.06.2025*]

Quality Management

Module name (EN): Quality Management

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-550

Hours per semester week / Teaching method:
30VS (30 hours)

ECTS credits:
5

Semester: 5

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 18.06.2025*]

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

Recommended prerequisites (modules):
WIBb21-110
WIBb21-240
WIBb21-420 Statistics and Data Analysis

[*updated 12.11.2025*]

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer:
Prof. Dr.-Ing. Christian Köhler
Lehrbeauftragte der htw saar
Lehrbeauftragte
Professor/innen des Studiengangs

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module, students will be familiar with the fundamental importance of quality management and the ISO standards DIN EN ISO 9000, 9001, 9004, and 19011. They will become aware of the importance of introducing, evaluating and further developing a quality management system. They will be able to plan and implement the QM methods covered in the course for specific manufacturing examples.
They will be familiar with QM models such as the QM model according to ISO 9004, TQM, and EFQM.

[*updated 18.06.2025*]

Module content:
Introduction to quality management
- Process management
Introduction to the ISO 9000 family
Motivation and dealing with change
Documentation of a management system
Quality planning
Audit management
Implementation of a quality management system in practice
Supplier management
Customer satisfaction and complaint management
Quality management tools and methods
Evaluating and further developing QM systems (CIP)
TQM basics (EFQM model)

[*updated 18.06.2025*]

Teaching methods/Media:
Lecture, digitally supported teaching, self-study

[*updated 18.06.2025*]

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
Zollondz, H.-D.: Grundlagen Qualitätsmanagement, 3.Auflage, Oldenbourg Wissenschaftsverlag, 2011
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

[*updated 18.06.2025*]

Simulation

Module name (EN): Simulation

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-660

Hours per semester week / Teaching method:
15VS+15US (30 hours)

ECTS credits:
5

Semester: 6

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 18.06.2025*]

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

Recommended prerequisites (modules):
WIBb21-120
WIBb21-220
WIBb21-230
WIBb21-320

WIBb21-330
WIBb21-530 Basics of Mechatronics and Hydraulics

[*updated 19.11.2025*]

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer:
Prof. Dr. Frank Kneip
Lehrbeauftragte der htw saar

[*updated 19.11.2025*]

Learning outcomes:
After successfully completing this module, students will:
be able to implement specified systems in Matlab/Simulink
be able to analyze the implemented models and the signals generated by them with regard to selected properties
be able to analyze and describe the influence of various parameters and initial conditions on the behavior of the system in response to questions
be able to select and adjust parameters and start conditions to generate a specified system behavior in a model

[*updated 18.06.2025*]

Module content:
1. Basics of MATLAB/Simulink
2. The implementation of technical and economic models from various fields of application (e.g., production, automotive, etc.)
3. Analysis and interpretation of simulation models

[*updated 18.06.2025*]

Teaching methods/Media:
Lectures, seminar-style teaching, digitally supported teaching, self-study

[*updated 18.06.2025*]

Recommended or required reading:
Glöckler, M.: Simulation mechatronischer Systeme Grundlagen und Beispiele für MATLAB und Simulink. Springer 2018
Pietruszka, W.: MATLAB und Simulink in der Ingenieurpraxis. Modellbildung, Berechnung, Simulation. Springer, 2014
Hoffmann, J.: Simulation technischer linearer und nichtlinearer Systeme mit Matlab/Simulink, DeGruyter, Oldenbourg, 2014
Nollau, R.: Modellierung und Simulation technischer Systeme. Springer, 2009
RRZN-Handbuch: Matlab/Simulink Eine Einführung.
Bosl, A.: Einführung in MATLAB/Simulink. Berechnung, Programmierung, Simulation. Hanser Verlag,

2017

[*updated 18.06.2025*]

Statistics and Data Analysis

Module name (EN): Statistics and Data Analysis

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-420

Hours per semester week / Teaching method:
30VS (30 hours)

ECTS credits:
5

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 18.06.2025*]

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

Recommended prerequisites (modules):
WIBb21-220

[*updated 12.11.2025*]

Recommended as prerequisite for:
WIBb21-550 Quality Management
WIBb21-730 Systems Engineering/ X in the Loop (HiL, SiL, MiL)

[*updated 12.11.2025*]

Module coordinator:
Studienleitung

Lecturer:
Prof. Dr. Susan Pulham

Lehrbeauftragte der htw saar
Lehrbeauftragte
Professor/innen des Studiengangs

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module, students will:
be able to prepare quantitative and qualitative data using descriptive statistical methods, and interpret results
be able to recognize stochastic situations as such and analyze them using stochastic models
They will, in particular, be able to calculate probabilities, determine suitable distribution forms, and estimate distribution parameters
Students will be able to demonstrate a basic understanding of inductive statistics, in particular methods of parameter estimation and hypothesis testing
They will be able to select and carry out appropriate test procedures for empirical questions and interpret the results adequately.

[*updated 18.06.2025*]

Module content:
1. Descriptive statistics
   - 1.1 Basic terms
   - 1.2 One- and two-dimensional frequency distributions
   - 1.3 Measures of location and measures of spread/dispersion
   - 1.4 Calculating correlation and regression
   - 1.5 Contingency calculation

2. Probability calculus
   - 2.1 Basic terms: random experiment, events, probability
   - 2.2 Modeling random experiments
   - 2.3 Multi-stage random experiments
   - 2.4 Conditional probability and independence
   - 2.5 Random variables, expected value, variance
   - 2.6 Calculation rules for expected values, variances, and covariances
   - 2.7 Important distributions and limit theorems

3. Basic elements of inferential statistics
   - 3.1 Problems with inferential statistics
   - 3.2 Point and interval estimates
   - 3.3 Hypothesis testing (parametric and non-parametric)

[*updated 18.06.2025*]

Teaching methods/Media:
Lecture, digitally supported teaching, self-study

[*updated 18.06.2025*]

Recommended or required reading:
Eckstein, Peter: Statistik für Wirtschaftswissenschaftler, 6. Auflage, Gabler, Wiesbaden, 2018
Eckstein, Peter: Klausurtraining Statistik, 4. Auflage, Gabler, Wiesbaden, 2005
Göllmann, Laurenz; Hübl, Reinhold; Pulham, Susan; Ritter, Stefan; Schon, Henning; Schüffler, Karlheinz;

Voß, Ursula; Vossen, Georg: Mathematik für Ingenieure: Verstehen Rechnen Anwenden: Band 1: Vorkurs, Analysis in einer Variablen, Lineare Algebra, Statistik, Springer Vieweg Verlag, Wiesbaden, 2017
Pulham, Susan: Statistik leicht gemacht, Gabler, Wiesbaden, 2011
Sachs, Michael: Wahrscheinlichkeitsrechnung und Statistik für Ingenieurstudenten an Fachhochschulen; 5. Auflage, Carl Hanser Verlag, 2018

[*updated 18.06.2025*]

Systems Engineering/ X in the Loop (HiL, SiL, MiL)

Module name (EN): Systems Engineering/ X in the Loop (HiL, SiL, MiL)

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-730

Hours per semester week / Teaching method:
30PA (30 hours per week)

ECTS credits:
5

Semester: 7

Mandatory course: yes

Language of instruction:
German

Assessment:
Project work

[*updated 11.06.2025*]

Workload:
450 class hours (= 337.5 clock hours) over a 15-week period.
The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore -187.5 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
WIBb21-150
WIBb21-230
WIBb21-330
WIBb21-340 Engineering Mechanics
WIBb21-420 Statistics and Data Analysis
WIBb21-430 Programming for Real-Time Systems
WIBb21-440 Machine Elements and CAD
WIBb21-530 Basics of Mechatronics and Hydraulics
WIBb21-630

[*updated 12.11.2025*]

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer:
Prof. Dr. Frank Kneip

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module, students will:
be able to develop a suitable concept for implementing a prototype design based on appropriate requirements for a system.
be able to select the appropriate components for the design of such a system based on the relevant requirements for a system and create the system as a prototype design.

[*updated 11.06.2025*]

Module content:
Creating a prototype system
1. Analysis of the requirements for the system
2. Selecting components
3. Prototype implementation of the system (e.g., using an Arduino Uno or Mega microcontroller)

[*updated 11.06.2025*]

Teaching methods/Media:
Project work

[*updated 11.06.2025*]

Recommended or required reading:
Lunze, J.: Regelungstechnik 1; 9. Auflage, Springer Verlag, 2013
Unbehauen, H.: Regelungstechnik 1; 15. Auflage, Vieweg+Teubner Verlag, 2008
Reuter, M., Zacher, S.: Regelungstechnik für Ingenieure; 12. Auflage, Vieweg+Teubner Verlag, 2008
Tröster, F.: Steuerungs- und Regelungstechnik für Ingenieure; 3. Auflage, Oldenbourg Verlag, 2011
Roddeck, W.: Einführung in die Mechatronik; 4. Auflage, Vieweg+Teubner Verlag, 2012
Bode, H.: Systeme der Regelungstechnik mit Matlab und Simulink Analyse und Simulation; Oldenbourg Verlag, 2010
Gasperi, M.: Labview for Lego Mindstorms NXT; National Technology & Science Press, 2008
RRZN Handbuch: Matlab/Simulink; 4. Auflage, 2012

[*updated 11.06.2025*]

Technische Production Planning

Module name (EN): Technische Production Planning

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-650

Hours per semester week / Teaching method:
30VS (30 hours)

ECTS credits:
5

Semester: 6

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 11.06.2025*]

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

Recommended prerequisites (modules):
WIBb21-100
WIBb21-110
WIBb21-300
WIBb21-400 Cost Accounting and the Basics of Management Accounting
WIBb21-440 Machine Elements and CAD
WIBb21-500 Investment and Financing

[*updated 12.11.2025*]

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer:
Prof. Dr.-Ing. Christian Köhler
Lehrbeauftragte der htw saar
Lehrbeauftragte
Professor/innen des Studiengangs

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module students will:
- be able to list the key constraints and tasks involved in planning production facilities, from site selection to factory layout design.
- be able to analyze products in terms of their suitability for manufacturing and assembly.
- be able to plan and evaluate value streams and work systems in the production environment (performance, costs, productivity, ergonomics, environmental impact).

- be able to critically reflect on the importance of quality and the environment as competitive and cost factors.
- be familiar with the basic requirements of common policies and standards for quality and environmental management and be able to apply them to production.

[*updated 11.06.2025*]

Module content:
Technical basics (lecture with exercises):
- Introduction
- Planning factories
- x-appropriate product design (Design for X)
- Planning value streams, work processes, and operating resources
- Designing ergonomic work systems
- Time and cost analysis and evaluation of production work systems
- Requirements and tasks of quality and environmental management

Practical application in the WI model factory workshop:
- Planning, computer simulation, physical mock-ups, and evaluation of human-centered workflows and work systems

[*updated 11.06.2025*]

Teaching methods/Media:
Lecture, digitally supported teaching, self-study

[*updated 11.06.2025*]

Recommended or required reading:
Feldhusen, J./Grote: K.-H.: Pahl/Beiz Konstruktionslehre. 7. & 8. Auflage, Berlin: SpringerVieweg
Wiendahl, H.-P. & Wiendahl, H.-H. (2019): Betriebsorganisation für Ingenieure. 9. Auflage, München: Hanser
Burggräf, P. & Schuh, G. (2021): Fabrikplanung, Handbuch Produktion und Management Band 4. 2. Auflage, Berlin: SpringerVieweg
Wiendahl, H.-P., Reichradt, J., & Nyhuis, P. (2009): Handbuch Fabrikplanung. München, Hanser
Bokranz, R., & Landau, K. (2012): Handbuch Industrial Engineering. Schäffer-Poeschel
Lotter, B., & Wiendahl, H.-P. (Hrsg.) (2013): Montage in der industriellen Produktion. 2. Auflage, Berlin: SpringerVieweg VDI-Buch
Eversheim, W. (1989): Organisation in der Produktionstechnik Band 4: Fertigung und Montage. 2. Auflage, VDI-Verlag
Köhler, C. (2017): Produktionsoptimierung mit Wertstromworkshops Leitfaden zur zielorientieren Optimierung und Gestaltung von Produktionsflüssen. Berlin: ePubli
Benes, G. & Groh, E. (2017): Grundlagen des Qualitätsmanagements, 4. Auflage, Carl Hanser Verlag
Jakoby, W. (2018): Qualitätsmanagement: Jakoby, W.; Qualitätsmanagement für Ingenieure Ein praxisnahes Lehrbuch für die Planung und Steuerung von Qualitätsprozessen; Springer Verlag, 2019; ISBN: 978-3-658-26595-3
Herrmann, J. & Fritz, H. (2016): Qualitätsmangament Lehrbuch für Studium und Praxis; 2. Auflage, Carl Hanser Verlag

[*updated 11.06.2025*]

Work Experience Phase II

Module name (EN): Work Experience Phase II

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-380

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

ECTS credits:
5

Semester: 3

Mandatory course: yes

Language of instruction:
German

Assessment:

[*updated 18.06.2025*]

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:
Studienleitung

Lecturer:
Studienleitung
Professor/innen des Studiengangs

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module students will:
be able to put their theoretical knowledge into practice by solving concrete problems.
be able to rethink what they have already learned and use it in practice.
have the ability to develop theories and solutions based on their knowledge.

have gained well-founded practical experience and can assert themselves in an operational environment.

[*updated 18.06.2025*]

Module content:
Students will tackle issues, that they encounter in current projects in their work experience phase.

The questions arising during the work experience phase must be addressed from both a practical and a scientific perspective and presented in accordance with the specified examination format, either in the form of a project report or a presentation.

Supervisors from the university and companies will provide support in selecting topics and clarifying the central question.

Students will select the topics for their business projects from a range of subject areas presented at the beginning of the semester.

The selection of a follow-up project for the subsequent practical module is permitted.

During the practical phase, the supervising professor serves as the students contact person.

After completing the work experience phase, students must write a report of approximately five pages on their practical experience.

Based on the student´s assessment in the work certificate submitted for the work experience phase and the supervising professor´s impression based on their supervision, the supervising professor decides whether to accept or reject the work performed as a work experience phase.

[*updated 18.06.2025*]

Teaching methods/Media:
Project work

[*updated 18.06.2025*]

Recommended or required reading:
M. Karmasin, R. Ribing: Die Gestaltung wissenschaftlicher Arbeiten: Ein Leitfaden für Seminararbeiten, Bachelor-, Master- und Magisterarbeiten, Diplomarbeiten und Dissertationen 2010
M. R. Theisen: Wissenschaftliches Arbeiten: Technik, Methodik, Form. 2008
Subject-related technical literature

[*updated 18.06.2025*]

Work Experience Phase III

Module name (EN): Work Experience Phase III

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-480

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

ECTS credits:
5

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:
Project work

[*updated 18.06.2025*]

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:
Studienleitung

Lecturer:
Studienleitung
Professor/innen des Studiengangs

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module students will:
- be able to put their theoretical knowledge into practice by solving concrete problems.
- be able to rethink what they have already learned and use it in practice.
- have the ability to develop theories and solutions based on their knowledge.
- have gained well-founded practical experience and can assert themselves in an operational environment.

[*updated 18.06.2025*]

Module content:
Students will tackle issues, that they encounter in current projects in their work experience phase.

The questions arising during the work experience phase must be addressed from both a practical and a scientific perspective and presented in accordance with the specified examination format, either in the form of a project report or a presentation.

Supervisors from the university and companies will provide support in selecting topics and clarifying the central question.

Students will select the topics for their business projects from a range of subject areas presented at the beginning of the semester.

The selection of a follow-up project for the subsequent practical module is permitted.

During the work experience phase, the supervising professor serves as the students contact person.

After completing the work experience phase, students must write a report of approximately five pages on their practical experience.

Based on the student´s assessment in the work certificate submitted for the work experience phase and the supervising professor´s impression based on their supervision, the supervising professor decides whether to accept or reject the work performed as a work experience phase.

[*updated 18.06.2025*]

Teaching methods/Media:
Project work

[*updated 18.06.2025*]

Recommended or required reading:
M. Karmasin, R. Ribing: Die Gestaltung wissenschaftlicher Arbeiten: Ein Leitfaden für Seminararbeiten, Bachelor-, Master- und Magisterarbeiten, Diplomarbeiten und Dissertationen 2010
M. R. Theisen: Wissenschaftliches Arbeiten: Technik, Methodik, Form. 2008
Subject-related technical literature

[*updated 18.06.2025*]

Work Experience Phase IV

Module name (EN): Work Experience Phase IV

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-580

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

ECTS credits:
5

Semester: 5

Mandatory course: yes

Language of instruction:
German

Assessment:
Project work

[*updated 18.06.2025*]

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:
Studienleitung

Lecturer:
Studienleitung
Professor/innen des Studiengangs

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module students will:
- be able to put their theoretical knowledge into practice by solving concrete problems.
- be able to rethink what they have already learned and use it in practice.
- have the ability to develop theories and solutions based on their knowledge.
- have gained well-founded practical experience and can assert themselves in an operational environment.

[*updated 18.06.2025*]

Module content:
Students will tackle issues, that they encounter in current projects in their work experience phase.

The questions arising during the work experience phase must be addressed from both a practical and a scientific perspective and presented in accordance with the specified examination format, either in the form of a project report or a presentation.

Supervisors from the university and companies will provide support in selecting topics and clarifying the central question.

Students will select the topics for their business projects from a range of subject areas presented at the beginning of the semester.

The selection of a follow-up project for the subsequent practical module is permitted.

During the work experience phase, the supervising professor serves as the students contact person.

After completing the work experience phase, students must write a report of approximately five pages on their practical experience.

Based on the student´s assessment in the work certificate submitted for the work experience phase and the supervising professor´s impression based on their supervision, the supervising professor decides whether to accept or reject the work performed as a work experience phase.

[*updated 18.06.2025*]

Teaching methods/Media:
Project work

[*updated 18.06.2025*]

Recommended or required reading:
M. Karmasin, R. Ribing: Die Gestaltung wissenschaftlicher Arbeiten: Ein Leitfaden für Seminararbeiten, Bachelor-, Master- und Magisterarbeiten, Diplomarbeiten und Dissertationen, 2010
M. R. Theisen: Wissenschaftliches Arbeiten: Technik - Methodik Form. 2008
Subject-related technical literature

[*updated 18.06.2025*]

Work Experience Phase V

Module name (EN): Work Experience Phase V

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-680

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

ECTS credits:
5

Semester: 6

Mandatory course: yes

Language of instruction:
German

Assessment:
Project work

[*updated 18.06.2025*]

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:
Studienleitung

Lecturer:
Studienleitung
Professor/innen des Studiengangs

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module students will:
have gained well-founded practical experience and can assert themselves in an operational environment.
be able to put their theoretical knowledge into practice by solving concrete problems.
be able to rethink what they have already learned and use it in practice.
have the ability to develop theories and solutions based on their knowledge.

[*updated 18.06.2025*]

Module content:
Students will tackle issues, that they encounter in current projects in their work experience phase.

The questions arising during the work experience phase must be addressed from both a practical and a scientific perspective and presented in accordance with the specified examination format, either in the form of a project report or a presentation.

Supervisors from the university and companies will provide support in selecting topics and clarifying the central question.

Students will select the topics for their business projects from a range of subject areas presented at the beginning of the semester.

The selection of a follow-up project for the subsequent practical module is permitted.

During the work experience phase, the supervising professor serves as the students contact person.

After completing the work experience phase, students must write a report of approximately five pages on their practical experience.

Based on the student´s assessment in the work certificate submitted for the work experience phase and the supervising professor´s impression based on their supervision, the supervising professor decides whether to accept or reject the work performed as a work experience phase.

[*updated 18.06.2025*]

Teaching methods/Media:
Project work

[*updated 18.06.2025*]

Recommended or required reading:
M. Karmasin, R. Ribing: Die Gestaltung wissenschaftlicher Arbeiten: Ein Leitfaden für Seminararbeiten, Bachelor-, Master- und Magisterarbeiten, Diplomarbeiten und Dissertationen. 2010
M. R. Theisen: Wissenschaftliches Arbeiten: Technik - Methodik Form. 2008
Subject-related technical literature

[*updated 18.06.2025*]

Work Experience Phase VI

Module name (EN): Work Experience Phase VI

Degree programme: Industrial Engineering, Bachelor, ASPO 01.10.2021

Module code: WIBb21-780

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

ECTS credits:
5

Semester: 7

Mandatory course: yes

Language of instruction:
German

Assessment:
Project work

[*updated 11.06.2025*]

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:
Studienleitung

Lecturer:
Studienleitung
Professor/innen des Studiengangs

[*updated 12.11.2025*]

Learning outcomes:
After successfully completing this module students will:
be able to put their theoretical knowledge into practice by solving concrete problems.
be able to rethink what they have already learned and use it in practice.
be able to develop theories and solutions based on their knowledge. They will have gained sound practical experience and will be able to assert themselves in a business environment.

[*updated 11.06.2025*]

Module content:
Students will tackle issues,
that they encounter in current projects in their work experience phase.
The questions arising during the work experience phase must be addressed from both a practical and a scientific perspective and presented in accordance with the specified examination format, either in the form of a project report or a presentation.

Supervisors from the university and companies will provide support in selecting topics and clarifying the central question.

Students will select the topics for their business projects from a range of subject areas presented at the beginning of the semester.

The selection of a follow-up project for the subsequent practical module is permitted.

During the work experience phase, the supervising professor serves as a contact person for the student.

After completing the work experience phase, students must write a report of approximately five pages on their practical experience.

Based on the student´s assessment in the work certificate submitted for the work experience phase and the supervising professor´s impression based on their supervision, the supervising professor decides whether to accept or reject the work performed as a work experience phase.

[*updated 11.06.2025*]

Teaching methods/Media:
Project work

[*updated 11.06.2025*]

Recommended or required reading:
M. Karmasin, R. Ribing: Die Gestaltung wissenschaftlicher Arbeiten: Ein Leitfaden für Seminararbeiten, Bachelor-, Master- und Magisterarbeiten, Diplomarbeiten und Dissertationen 2010
M. R. Theisen: Wissenschaftliches Arbeiten: Technik - Methodik Form 2008
Subject-related technical literature

[*updated 11.06.2025*]

Industrial Engineering Bachelor - optional courses