Course Handbook Mechanical Engineering Bachelor

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Mechanical Engineering Bachelor - mandatory courses (overview)

Module name (EN)	Code	SAP-P	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator
Bachelor Thesis	DFBME-603	T610-0349	6	-	12	Studienleitung
Bachelor Thesis Colloquium	DFBME-604	S610-0350	6	2C	3	Studienleitung
CAD Technology	DFBME-311	P610-0326, P610-0339, P610-0543	3	4SU	4	Dipl.-Ing. Bernd Gaspard
Dynamique	DFBME-318	P610-0629	3	4SU	5	Prof. Dr.-Ing. Heike Jaeckels
English 3	DFBME-305	P610-0315	3	2VU	2	Dr. Julia Frisch
English 4	DFBME-405	P610-0320	4	2VU	2	Dr. Julia Frisch
Fluid Mchanics	DFBME-409	P610-0329, P610-0344, P610-0548	4	4VU	5	Prof. Dr. Marco Günther
French 3	DFBME-302	P610-0316	3	4VU	4	Dr. Julia Frisch
French 4	DFBME-402	P610-0321	4	4VU	4	Dr. Julia Frisch
Fundamental Principles of Automotive Engineering	DFBME-313	P610-0327, P610-0545	3	3V	3	Prof. Dr. Jürgen Griebsch

Module name (EN)	Code	SAP-P	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator
Fundamentals of Piston Engines, Pumps and Compressors	DFBME-312	P610-0324, P610-0544, P610-0568, P610-0569	3	4V	5	Prof. Dr.-Ing. Thomas Heinze
German 3	DFBME-301	P610-0086	3	4VU	4	Dr. Julia Frisch
German 4	DFBME-401	P610-0318	4	4VU	4	Dr. Julia Frisch
Intercultural Management 3	DFBME-304	P610-0319	3	2VU	2	Dr. Julia Frisch
Intercultural Management 4	DFBME-404	P610-0322	4	2VU	2	Dr. Julia Frisch
Materials Technology	DFBME-316	P610-0630	3	4VU	5	Prof. Dr. Moritz Habschied
Metrology and Control Eingineering + Lab	DFBME-418	P610-0632, P610-0633	4	3V+1LU	5	Prof. Dr.-Ing. Thomas Heinze
Numerical Mathematics and Numerical Simulation	DFBME-412	P610-0331, P610-0549, P610-0570, P610-0571	4	4V	5	Prof. Dr. Marco Günther
Project work	DFBME-602	P610-0348	6	3PA	6	Prof. Dr.-Ing. Heike Jaeckels
Project, Presentation and Report	DFBME-411	P610-0333, P610-0346	4	1CM+2PA	3	Prof. Dr.-Ing. Heike Jaeckels
Thermodynamics	DFBME-407	P610-0341, P610-0547	4	4SU+2U	5	Dr. Olivia Freitag-Weber
Work Experience Phase	DFBME-601	S610-0347	6	-	9	Studienleitung

(22 modules)

Mechanical Engineering Bachelor - optional courses (overview)

Module name (EN)	Code	SAP-P	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator
Spanish 3	DFBME-306	P610-0334, P610-0631	3	4VU	4	Dr. Julia Frisch
Spanish 4	DFBME-408	P610-0343, P610-0628	4	4VU	4	Dr. Julia Frisch

(2 modules)

Mechanical Engineering Bachelor - mandatory courses

Bachelor Thesis

Module name (EN): Bachelor Thesis
Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024
Module code: DFBME-603
Hours per semester week / Teaching method: -
ECTS credits: 12
Semester: 6
Mandatory course: yes
Language of instruction: German/English/French
Assessment: [*updated 08.01.2024*]
Applicability / Curricular relevance:

DFBME-603 (T610-0349) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 6, mandatory course
DFBME-603 (T610-0349) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 6, mandatory course

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

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer: Studienleitung

[*updated 28.04.2023*]

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

* be able to work on a defined problem from the field of mechanical engineering (see below) independently and using scientific methods within a specified period of time
* be able to apply project and time management methods efficiently
* be able to collect and evaluate the information required to answer their research question independently
* be able to prepare a written thesis in accordance with scientific standards.

[*updated 08.01.2024*]

Module content:
The bachelor thesis is a comprehensive scientific paper on a defined topic, which is usually proposed by a company. The topic is formulated in detail in writing together with the supervisors and the student. Students are given 3 months to write their thesis.

The topic is closely related to the development, design, production and/or operation of machines and systems. Various course content is used during the course of the thesis, as well as knowledge that builds on or deepens this.

[*updated 08.01.2024*]

Recommended or required reading:

[*updated 08.01.2024*]

Bachelor Thesis Colloquium

Module name (EN): Bachelor Thesis Colloquium

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-604

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

ECTS credits:
3

Semester: 6

Mandatory course: yes

Language of instruction:
German/English

Assessment:
Oral examination

[*updated 08.05.2023*]

Applicability / Curricular relevance:

DFBME-604 (S610-0350) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 6, mandatory course
DFBME-604 (S610-0350) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 6, mandatory 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 28.04.2023*]

Learning outcomes:

After successfully completing this module, students will:

* be able to orally present their topic, problem-solving method, and intermediate or final results of their BA thesis in an appropriate manner and to an audience of professionals.
* be able to prepare and use suitable media to support their presentation
* be able to critically examine and question the (interim) results they have achieved
* be able to take part in a discussion with a specialist audience on the content of their thesis and related issues.

[*updated 23.02.2024*]

Module content:
A mid-term colloquium will be held halfway through the BA thesis. This part of the course work will not be graded, but will be analyzed in a feedback session with the lecturer.

The final colloquium will take place for all students in a block seminar at the end of the 6th semester and will be graded individually. A one-on-one appointment may be arranged where warranted.
Both the oral expression and the design of the written presentation will be evaluated and reflected upon in another feedback session.

[*updated 23.02.2024*]

Teaching methods/Media:
Seminar-style teaching with instructions for creating presentation documents
Feedback discussions on the content of the thesis with regard to preparing for the colloquium

[*updated 23.02.2024*]

Recommended or required reading:

[*updated 08.05.2023*]

CAD Technology

Module name (EN): CAD Technology

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-311

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

ECTS credits:
4

Semester: 3

Mandatory course: yes

Language of instruction:
German

Assessment:

[*still undocumented*]

Applicability / Curricular relevance:

DFBME-311 (P610-0326, P610-0339, P610-0543) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 3, mandatory course
DFBME-311 (P610-0326, P610-0339, P610-0543) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 3, mandatory course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 120 hours (equivalent to 4 ECTS credits).
There are therefore 75 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Dipl.-Ing. Bernd Gaspard

Lecturer: Dipl.-Ing. Bernd Gaspard

[*updated 28.04.2023*]

Learning outcomes:
After successfully completing this module, students will be able to model components using the "Autodesk Inventor Professional" CAD system and its basic functions and commands.
Students will be aware of the production-oriented adherence to guidelines regarding the standardization of components.

[*updated 04.12.2020*]

Module content:
Basics of 3D CAD technology.
Overview of the current state of the art and future developments.
Basic applications and functions: Structural components, assemblies, drawing views, exploded-view drawings
Standardized names of structural components, elements and detail surfaces (groove, chamfer, pocket, shaft, undercut, etc.).

Thinking through the production steps suitable for the production of the components with their detailed

surfaces and roughly planning the sequence in terms of a production process.

[*updated 04.12.2020*]

Teaching methods/Media:
Lecture using multimedia-supported training courses and integrated exercises.

[*updated 04.12.2020*]

Recommended or required reading:
Inventor 2020 Grundlagen, Herdt Verlag, ISBN: 978-3-86249-856-7
Basiskurs für Autodesk Inventor 2020; Armin Gräf Verlag, www.armin-graef.de/shop

Grundlagenkurs Inventor 2019, Carl Hanser Verlag GmbH & Co. KG can be downloaded from the htw library!

Grundlagenkurs Inventor 2019, Carl Hanser Verlag GmbH & Co. KG can be downloaded from the htw library!

[*updated 04.12.2020*]

Dynamique

Module name (EN): Dynamique

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-318

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

ECTS credits:
5

Semester: 3

Mandatory course: yes

Language of instruction:
German

Assessment:
Exam

[*updated 16.11.2023*]

Applicability / Curricular relevance:

DFBME-413 (P610-0332, P610-0550) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course
DFBME-318 (P610-0629) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , 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):
None.

Recommended as prerequisite for:

Module coordinator:
Prof. Dr.-Ing. Heike Jaeckels

Lecturer: Prof. Dr.-Ing. Heike Jaeckels

[*updated 28.04.2023*]

Learning outcomes:
After successfully completing this course, students will be able to:
* mathematically describe plane motions of point masses and rigid bodies
* analyze and calculate dynamic rigid bodies

[*updated 16.11.2023*]

Module content:
Kinematics of a rigid body
Kinematics of mass point
Kinetics of a rigid body, work and energy

[*updated 16.11.2023*]

Teaching methods/Media:
Course with seminaristic components using the "inverted classroom" method

[*updated 16.11.2023*]

Recommended or required reading:
See documents accompanying the course

[*updated 16.11.2023*]

English 3

Module name (EN): English 3

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-305

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

ECTS credits:
2

Semester: 3

Mandatory course: yes

Language of instruction:
German

Assessment:
60 h: Workshop 30 h - Independent learning 30 h

[*updated 15.04.2024*]

Applicability / Curricular relevance:

DFBGE-020 (P610-0026) Electrical Engineering - Renewable Energy and System Technology, Bachelor, ASPO 01.10.2018 , semester 3, mandatory course
DFBEES-305 (P610-0026) Electrical Engineering - Renewable Energy and System Technology, Bachelor, ASPO 01.10.2019 , semester 3, mandatory course
DFBGE-020 (P610-0026) Electrical Engineering, Bachelor, ASPO 01.10.2015 , semester 3, mandatory course
DFBGM309 Mechanical Engineering, Bachelor, ASPO 01.10.2018 , semester 3, mandatory course
DFBME-305 (P610-0315) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 3, mandatory course
DFBME-305 (P610-0315) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 3, mandatory course
DFBI-313 (P610-0228) Computer Science and Web Engineering, Bachelor, ASPO 01.10.2018 , semester 3, mandatory course
DFIW-305 (P610-0179) Computer Science and Web Engineering, Bachelor, ASPO 01.10.2019 , semester 3, mandatory course

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:
Dr. Julia Frisch

Lecturer: Dr. Julia Frisch

[*updated 28.04.2023*]

Learning outcomes:
The initial level is B1, target level is B1+/lower B2.

After successfully completing this module, students will:

- be able to grasp the main ideas of complex texts on both concrete and abstract topics
- be able to follow technical discussions in his/her field of specialization.
- be able to express themselves clearly and in detail on a wide range of topics
- be able to explain points of view on a current issue, as well as state the advantages and disadvantages of various options
- have developed strategies and methods for compiling and summarizing important information in a presentation, an experimental setup or a technical lecture in English

[*updated 15.04.2024*]

Module content:

Introduction to the technical language used in technical standards and instructions
Discussion of topic-related specialist texts from the entire spectrum of the subject
Corporate structure (centralized and decentralized organizations)
Reading, describing, evaluating and creating graphics and tables

[*updated 15.04.2024*]

Teaching methods/Media:

The learning content is developed in a communicative and action-oriented manner with targeted listening, reading and speaking exercises in individual, partner and group work. A subject-related presentation on the course content is obligatory.

Short written or oral reviews of learning progress are possible at any time.

[*updated 15.04.2024*]

Recommended or required reading:
Literature and learning materials will be provided during the course

[*updated 15.04.2024*]

English 4

Module name (EN): English 4

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-405

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

ECTS credits:

2

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:
Written exam (90 min.)

[*updated 04.12.2020*]

Applicability / Curricular relevance:

DFBGE-030 (P610-0032) Electrical Engineering - Renewable Energy and System Technology, Bachelor, ASPO 01.10.2018 , semester 4, mandatory course
DFBEES-405 (P610-0032) Electrical Engineering - Renewable Energy and System Technology, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course
DFBGE-030 (P610-0032) Electrical Engineering, Bachelor, ASPO 01.10.2015 , semester 4, mandatory course
DFBGM409 Mechanical Engineering, Bachelor, ASPO 01.10.2018 , semester 4, mandatory course
DFBME-405 (P610-0320) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course
DFBME-405 (P610-0320) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 4, mandatory course
DFBI-413 (P610-0232) Computer Science and Web Engineering, Bachelor, ASPO 01.10.2018 , semester 4, mandatory course
DFIW-405 (P610-0186) Computer Science and Web Engineering, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course

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:
Dr. Julia Frisch

Lecturer: Dr. Julia Frisch

[*updated 28.04.2023*]

Learning outcomes:
After successfully completing this course, students will be able to pronunciate words correctly and speak well. They will have mastered an extensive general vocabulary. They will be able to use grammatical structures in English with confidence. Students will understand simple to moderately difficult general and

specialized texts (reading comprehension, listening comprehension). According to the Common European Framework students will reach the B2/C1 level.

[*updated 04.12.2020*]

Module content:
Advanced grammar and vocabulary, such as past and future tenses, conditionals, gerunds, reported speech, prepositions, modal verbs Discussions about general and technical topics. Practical application. Translation of simple to intermediate sentences from German into English and vice versa. Regional studies.

[*updated 04.12.2020*]

Teaching methods/Media:
Text analysis, answering questions in oral and written form, presentations, role playing, discussions.

[*updated 04.12.2020*]

Recommended or required reading:
Copies from various sources (general and specialized texts, Raymond Murphy: Grammar in Use) as a script for students

[*updated 04.12.2020*]

Fluid Mchanics

Module name (EN): Fluid Mchanics

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-409

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

ECTS credits:
5

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:

[*still undocumented*]

Applicability / Curricular relevance:

DFBME-409 (P610-0329, P610-0344, P610-0548) Mechanical Engineering, Bachelor, ASPO 01.10.2019 ,

semester 4, mandatory course
DFBME-409 (P610-0329, P610-0344, P610-0548) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , 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):
None.

Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Marco Günther

Lecturer: Prof. Dr. Marco Günther

[*updated 28.04.2023*]

Learning outcomes:
After successfully completing this module, students will be familiar with the basics of fluid mechanical quantities and laws. They will be able to apply the laws of fluid mechanics to simple practical problems from the fields of hydrostatics, hydrodynamics and aerodynamics. Students will be able to perform calculations of state variables in incompressible and compressible flows and have basic experience in using a calculation tool. Exercises will teach students to classify fluid statics and steady-state fluid mechanical processes and their effects, taking into account the factors that influence them, and to calculate them in engineering terms.

[*updated 14.06.2021*]

Module content:
Fluid statics:
fluid properties, state variables, pressure concept and distribution, effects of force on container walls, buoyancy and thermal lift
Incompressible frictionless flows:
current filament theory, equations of motion for a fluid element, conservation laws of the stationary current filament theory (conservation of mass, energy theorem), pressure and velocity measurement
Incompressible frictional flows:
Frictional influence, fluid mechanical similarity and indices, laminar and turbulent flow, steady-state pipe flow, flows in piping systems, outflow processes.
Incompressible flows:
Principle of linear momentum, principle of angular momentum
Compressible flows:
Energy equation, outflow processes, supersonic flow
Application of computational fluid dynamics:
Exemplary applications of CFD simulation software (like Ansys Fluent, Ansys CFX, Comsol Multiphysics)

[*updated 14.06.2021*]

Teaching methods/Media:
- Lecture with integrated exercises, exercises for self-study
Blackboard, transparencies, lecture notes, videos, exercises

[*updated 14.06.2021*]

Recommended or required reading:
Bohl: Technische Strömungslehre; v. Böckh: Fluidmechanik; Herwig: Strömungsmechanik; Herwig: Strömungsmechanik A-Z; Kümmel: Technische Strömungsmechanik; Oertel, Böhle, Dohrmann: Strömungsmechanik

[*updated 14.06.2021*]

French 3

Module name (EN): French 3

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-302

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

ECTS credits:
4

Semester: 3

Mandatory course: yes

Language of instruction:
German

Assessment:
Written exam (50%) + term paper with presentation (25%) + tests (25%)

[*updated 04.12.2020*]

Applicability / Curricular relevance:

DFBGE-060 (P610-0027) Electrical Engineering - Renewable Energy and System Technology, Bachelor, ASPO 01.10.2018 , semester 3, mandatory course
DFBEES-302 (P610-0027) Electrical Engineering - Renewable Energy and System Technology, Bachelor, ASPO 01.10.2019 , semester 3, mandatory course
DFBGE-060 (P610-0027) Electrical Engineering, Bachelor, ASPO 01.10.2015 , semester 3, mandatory course
DFBGM308 Mechanical Engineering, Bachelor, ASPO 01.10.2018 , semester 3, mandatory course
DFBME-302 (P610-0316) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 3, mandatory course
DFBME-302 (P610-0316) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 3, mandatory course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.

The total student study time is 120 hours (equivalent to 4 ECTS credits).
There are therefore 75 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Dr. Julia Frisch

Lecturer: Dr. Julia Frisch

[*updated 28.04.2023*]

Learning outcomes:
After successfully completing this module, students will:
- have attained language skills at the lower and intermediate C1 level of the Common European Framework of Reference for Languages (CEFR),

Skills: After successfully completing this module, students will be able to:
understand the global and detailed information in difficult texts pertaining to concrete and abstract topics,
follow factually complex technical discussions in their own field of expertise,
communicate using a wide range of linguistic means allowing them to conduct conversations with native speakers in an idiomatic and communicative manner,
express themselves in writing on a wide range of general and selected scholarly topics,
hold job and subject-oriented presentations and prepare the corresponding written materials in a linguistically appropriate manner and, to a great extent, error-free

Competences: After successfully completing this module, students will:
- have mastered the grammar relevant for the above skills, the basic general vocabulary, the advanced French vocabulary and some French business vocabulary,
- be sensitive to the intercultural characteristics of countries belonging to the francophone world and thus, be able to successfully manage important communication situations in daily (business) life and
- be capable of embracing the intercultural differences of countries belonging to the francophone world and verbally interact there successfully.

[*updated 04.12.2020*]

Module content:
Maintain the extensive general French vocabulary acquired in previous levels of learning,
Advanced acquisition of an extensive vocabulary in an engineering and technical environment,
Advanced English grammar and awareness of its potential for use in technical language,
Pronounced communication skills with regard to scientific language in order to take part in discussions, hold presentations and write texts belonging to the most important scientifically-relevant text types on a high level,
Improve reading and listening comprehension skills through appropriate exercises.

[*updated 04.12.2020*]

Teaching methods/Media:
Use a wide range of media: television and video, radio, magazines and newspapers, computer-based interactivity
Partner work, group work and role playing
Presentations and short talks by students
Presentations by the lecturer
Plenary and group discussions
The goal is to enable authentic foreign language communication.

[*updated 04.12.2020*]

Recommended or required reading:
Teaching materials compiled by the lecturer

[*updated 04.12.2020*]

French 4

Module name (EN): French 4

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-402

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

ECTS credits:
4

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:
Written exam (50%) + presentation (25%) + tests (25%)

[*updated 04.12.2020*]

Applicability / Curricular relevance:

DFBGE-061 (P610-0034) Electrical Engineering - Renewable Energy and System Technology, Bachelor, ASPO 01.10.2018 , semester 4, mandatory course
DFBEES-402 (P610-0034) Electrical Engineering - Renewable Energy and System Technology, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course
DFBGE-061 (P610-0034) Electrical Engineering, Bachelor, ASPO 01.10.2015 , semester 4, mandatory course
DFBGM408 Mechanical Engineering, Bachelor, ASPO 01.10.2018 , semester 4, mandatory course

DFBME-402 (P610-0321) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course
DFBME-402 (P610-0321) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 4, mandatory course
DFBI-412 (P610-0233) Computer Science and Web Engineering, Bachelor, ASPO 01.10.2018 , semester 4, mandatory course
DFIW-402 (P610-0187) Computer Science and Web Engineering, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 120 hours (equivalent to 4 ECTS credits).
There are therefore 75 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Dr. Julia Frisch

Lecturer: Dr. Julia Frisch

[*updated 28.04.2023*]

Learning outcomes:
- The foreign language will be taught with a subject-related approach.
- Subject-related, specialized grammar will be imparted to the students.
- After successfully completing this course, students will be able to understand intermediate newspaper and magazine articles from the French and francophone press.
- Students will be able to understand technically relevant, orally presented texts.
- They will have improved their writing skills.
- Students will be prepared for a possible career in a country where the target language is spoken.
- Students will have enlarged their technical vocabulary.

[*updated 04.12.2020*]

Module content:
- (Inter)culturally relevant, current topics pertaining to the countries in which the target language is spoken.
- Topics related to the students' lectures
- Specialized vocabulary within the context of the topics (subject areas) discussed
- Subject-related, specialized grammar
- Introduction to reading articles systematically

[*updated 04.12.2020*]

Teaching methods/Media:
- Presentations by the lecturer
- Plenary and group discussions
- Group work phases where students tackle specific tasks
- Multimedia language lab

- Student presentations

[*updated 04.12.2020*]

Recommended or required reading:
- Teaching materials: texts and exercises compiled by the lecturer
- PowerPoint presentations by the lecturer or equivalent visualization forms
- Internet resources

[*updated 04.12.2020*]

Fundamental Principles of Automotive Engineering

Module name (EN): Fundamental Principles of Automotive Engineering

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-313

Hours per semester week / Teaching method:
3V (3 hours per week)

ECTS credits:
3

Semester: 3

Mandatory course: yes

Language of instruction:
German

Assessment:
Written exam 120 min.

[*updated 30.09.2020*]

Applicability / Curricular relevance:

DFBME-313 (P610-0327, P610-0545) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 3, mandatory course
DFBME-313 (P610-0327, P610-0545) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 3, mandatory course
FT14 (P242-0047) Automotive Engineering, Bachelor, ASPO 01.10.2011 , semester 3, mandatory course
FT14 (P242-0047) Automotive Engineering, Bachelor, ASPO 01.10.2015 , semester 3, mandatory course
FT14 (P242-0047) Automotive Engineering, Bachelor, ASPO 01.04.2016 , semester 3, mandatory course
FT14 (P242-0047) Automotive Engineering, Bachelor, ASPO 01.10.2019 , semester 3, mandatory course

Workload:
45 class hours (= 33.75 clock hours) over a 15-week period.

The total student study time is 90 hours (equivalent to 3 ECTS credits).
There are therefore 56.25 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Jürgen Griebsch

Lecturer: Prof. Dr. Jürgen Griebsch

[*updated 28.04.2023*]

Learning outcomes:
In this course, students will receive an overview of the most important manufacturing processes and the machine tools used for these processes.
They will be able to:
- roughly compare the manufacturing processes suitable for the production of a component
- recognize the specific properties.

[*updated 30.09.2020*]

Module content:
1. Manufacturing processes
1.1 Primary processing (e.g. casting)
1.1.1 Casting
1.1.2 Sintering
1.2 Forming
1.2.1 Extrusion
1.2.2 Deep drawing
1.3 Machining
1.3.1 Turning
1.3.2 Milling
1.3.3 Grinding
2. Machine tools
2.1 Forming machines
2.1.1 Hammers
2.1.2 Presses
2.2 Machine tools for machinig with geometrically defined tools
2.2.1 Lathes
2.2.2 Drilling machines
2.2.3 Milling machines
2.3 Machine tools for machinig with geometrically undefined tools
2.3.1 Cylindrical grinding machines
2.3.2 Surface grinding machines
2.3.3 Form grinding machines
2.3.4 Dressing systems
2.3.5 Balancing machines

[*updated 30.09.2020*]

Teaching methods/Media:
Lecture script and experiment documentation

[*updated 30.09.2020*]

Recommended or required reading:
- Fritz Schulze; Fertigungstechnik, VDI-Verlag, Düsseldorf 1998
- Spur, Stöferle; Grundlagen der Fertigungstechnik, Carl Hauser Verlag, München
- Hirsch, Andreas; Werkzeugmaschinen Grundlagen
- Tschätsch, Heinz; Praxis der Umformtechnik, Verlag Teubner
- Tschätsch, Heinz; Praxis der Zerspantechnik, Verlab Teubner

[*updated 30.09.2020*]

Fundamentals of Piston Engines, Pumps and Compressors

Module name (EN): Fundamentals of Piston Engines, Pumps and Compressors

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-312

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

ECTS credits:
5

Semester: 3

Mandatory course: yes

Language of instruction:
German

Assessment:
Written exam 90 min.

[*updated 30.09.2020*]

Applicability / Curricular relevance:

DFBGM405 Mechanical Engineering, Bachelor, ASPO 01.10.2018 , semester 4, mandatory course
DFBME-312 (P610-0324, P610-0544, P610-0568, P610-0569) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 3, mandatory course
DFBME-312 (P610-0324, P610-0544, P610-0568, P610-0569) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 3, mandatory course
FT11 (P242-0048, P242-0049) Automotive Engineering, Bachelor, ASPO 01.10.2011 , semester 3, mandatory course
FT11 (P242-0048, P242-0049) Automotive Engineering, Bachelor, ASPO 01.10.2015 , semester 3, mandatory course
FT11 (P242-0048, P242-0049) Automotive Engineering, Bachelor, ASPO 01.04.2016 , semester 3, mandatory course

FT11 (P242-0048, P242-0049) Automotive Engineering, Bachelor, ASPO 01.10.2019 , 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):
None.

Recommended as prerequisite for:

Module coordinator:
Prof. Dr.-Ing. Thomas Heinze

Lecturer: Prof. Dr.-Ing. Thomas Heinze

[*updated 28.04.2023*]

Learning outcomes:
After successfully completing this part of the module, students will be able to describe well-known types of pistons and turbomachinery, especially their basic structure and function. They will be able to assign the suitable machine to given applications and estimate or set operating points from the machines´ operating behavior.

[*updated 30.09.2020*]

Module content:
Piston engines
- Basics, mode of operation, operating behavior:
    - Piston compressors
    - Piston pumps
    - Piston steam engines
    - Internal combustion engines

Turbomachinery
- Basics, mode of operation, operating behavior with regard to:
    - Axial and radial compressors
    - Axial and radial pumps
    - Steam turbines
    - Water turbines
    - Gas turbines

[*updated 30.09.2020*]

Teaching methods/Media:
Lecture with tutorials;
Lecture: Documents, examples with discussion; exercises
Lab experiments: Developing and experiencing specific key aspects of the subject matter by means of supervised laboratory experiments.

[*updated 30.09.2020*]

Recommended or required reading:
- Küttner: Kolbenmaschinen
- Beitz, Grote - Hrsg.: Dubbel-Taschenbuch für den Maschinenbau, Kapitel Kolbenmaschinen, Kapitel Strömungsmaschinen
- Urlaub: Verbrennungsmotoren
- Bohl, Elmendorf: Strömungsmaschinen

[*updated 30.09.2020*]

German 3

Module name (EN): German 3

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-301

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

ECTS credits:
4

Semester: 3

Mandatory course: yes

Language of instruction:
German

Assessment:
Written exam

[*updated 04.12.2020*]

Applicability / Curricular relevance:

DFBGE-019 (P610-0025) Electrical Engineering - Renewable Energy and System Technology, Bachelor, ASPO 01.10.2018 , semester 3, mandatory course
DFBEES-301 (P610-0025) Electrical Engineering - Renewable Energy and System Technology, Bachelor, ASPO 01.10.2019 , semester 3, mandatory course
DFBGE-019 (P610-0025) Electrical Engineering, Bachelor, ASPO 01.10.2015 , semester 3, mandatory course
DFBGM307 Mechanical Engineering, Bachelor, ASPO 01.10.2018 , semester 3, mandatory course
DFBME-301 (P610-0086) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 3, mandatory course
DFBME-301 (P610-0086) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 3, mandatory course
DFBI-311 (P610-0227) Computer Science and Web Engineering, Bachelor, ASPO 01.10.2018 , semester 3, mandatory course
DFIW-301 (P610-0178) Computer Science and Web Engineering, Bachelor, ASPO 01.10.2019 , semester 3, mandatory course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 120 hours (equivalent to 4 ECTS credits).
There are therefore 75 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Dr. Julia Frisch

Lecturer:
Dozierende des Studiengangs

[*updated 28.06.2023*]

Learning outcomes:
After successfully completing this course, students will have improved their language skills to level B1/B2 (GER).

Listening comprehension/speaking skills
Students will be able to follow a presentation on a topic, give a presentation or initiate a conversation on a relatively broad range of topics. They will have improved their pronunciation.

Reading comprehension
Students will be able to extract relevant information from texts and understand detailed instructions or advice.

Writing
Students will be able to take notes during a conversation/lecture or write a letter that includes non-standard requests.

Grammar/Structures in scientific language
Students will be able to recognize and apply grammatical structures.

[*updated 04.12.2020*]

Module content:
Listening comprehension/speaking skills
- Student presentations on various topics
- Group discussions on various topics
- Speech techniques and strategies
- Speaking in specific situations
- Various audio texts, audiovisual material (general and technical)
- Phonetics

Reading comprehension
- Recognizing and editing different types of text
- Developing and applying reading strategies

- Developing and enlarging vocabulary
Writing
- Memo technique for taking notes with listening comprehension texts / summarizing texts
- Writing formal and personal letters and e-mails
- Free, narrative writing
- Written version of the presentation held in class; scientific writing
- Orthography and punctuation
Grammar/Structures in scientific language
- Practicing and using relevant grammatical structures e.g. adjective declension; conjugation in all tenses, active/passive, subjunctive, causal, temporal, concessive, conditional, modal subordinate clauses, prepositions

[*updated 04.12.2020*]

Teaching methods/Media:
Blackboard, PC presentation; Text and exercise sheets, audio CDs, DVD

[*updated 04.12.2020*]

Recommended or required reading:
Various textbooks (e.g. Mittelpunkt neu), current publications, audio-visual media

[*updated 04.12.2020*]

German 4

Module name (EN): German 4

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-401

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

ECTS credits:
4

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:
Written exam

[*updated 04.12.2020*]

Applicability / Curricular relevance:

DFBGE-029 (P610-0031) Electrical Engineering - Renewable Energy and System Technology, Bachelor, ASPO 01.10.2018 , semester 4, mandatory course
DFBEES-401 (P610-0031) Electrical Engineering - Renewable Energy and System Technology, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course
DFBGE-029 (P610-0031) Electrical Engineering, Bachelor, ASPO 01.10.2015 , semester 4, mandatory course
DFBGM407 Mechanical Engineering, Bachelor, ASPO 01.10.2018 , semester 4, mandatory course
DFBME-401 (P610-0318) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course
DFBME-401 (P610-0318) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 4, mandatory course
DFBI-411 (P610-0553) Computer Science and Web Engineering, Bachelor, ASPO 01.10.2018 , semester 4, mandatory course
DFIW-401 (P610-0185) Computer Science and Web Engineering, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 120 hours (equivalent to 4 ECTS credits).
There are therefore 75 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Dr. Julia Frisch

Lecturer: Dr. Julia Frisch

[*updated 28.04.2023*]

Learning outcomes:
Language skills at level B1+/B2 (GER)

Listening comprehension/speaking skills
Students will be able to follow a presentation on a topic, give a presentation or initiate a conversation on a relatively broad range of topics. They will have improved their pronunciation.

Reading comprehension
Students will be able to extract relevant information from texts and understand detailed instructions or advice.

Writing
Students will be able to take notes during a conversation/lecture or write a letter that includes non-standard requests.

Grammar/Structures in scientific language
Students will be able to recognize and apply grammatical structures.

[*updated 04.12.2020*]

Module content:
Listening comprehension/speaking skills
- Student presentations on various topics
- Group discussions on various topics
- Speech techniques and strategies
- Speaking in specific situations
- Various listening comprehension texts, audiovisual material (general and technical)
- Phonetics

Reading comprehension
- Recognizing and editing different types of text
- Developing and applying reading strategies
- Developing and enlarging vocabulary

Writing
- Memo technique for taking notes with listening comprehension texts / summarizing texts
- Writing formal and personal letters and e-mails
- Free, narrative writing
- Scientific writing/ written version of the presentation held in class
- Orthography and punctuation

Grammar/Structures in scientific language
- Practicing and using relevant grammatical structures e.g. adjective declension; conjugation in all tenses, active/passive, subjunctive, causal, temporal, concessive, conditional, modal subordinate clauses, prepositions

[*updated 04.12.2020*]

Teaching methods/Media:
Blackboard, PC presentation; Text and exercise sheets, audio CDs, DVD

[*updated 04.12.2020*]

Recommended or required reading:
Various textbooks (e.g. Mittelpunkt neu B2), current publications, audio-visual media

[*updated 04.12.2020*]

Intercultural Management 3

Module name (EN): Intercultural Management 3

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-304

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

ECTS credits:
2

Semester: 3

Mandatory course: yes

Language of instruction:
German

Assessment:
Written exam (60%,), presentation (40%) Each exam must be passed on its own.

[*updated 08.01.2024*]

Applicability / Curricular relevance:

DFBME-304 (P610-0319) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 3, mandatory course
DFBME-304 (P610-0319) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 3, mandatory course

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:
DFBME-404 Intercultural Management 4

[*updated 21.06.2024*]

Module coordinator:
Dr. Julia Frisch

Lecturer: Dr. Julia Frisch

[*updated 28.04.2023*]

Learning outcomes:
After successfully completing this module, students will be able to:
- define and explain concepts and terms such as culture, stereotypes and perception of others
- describe cultural differences in working life with a focus on the Franco-German context
- explain and critically reflect on various models of cultural comparison
- explain typical critical incidents from the Franco-German working environment with regard to intercultural differences and propose solutions
- work out individual cultural differences and peculiarities for themselves using case studies

[*updated 08.01.2024*]

Module content:
- apply different cultural models and definitions
- recognize different levels of communication and their associated special features in an intercultural

context (gestures, facial expressions, proxemics).
Perception of others, stereotypes and prejudices
At least two different models of cultural comparison in contrast (e.g. Hofstede, Lewis, Thomas, GLOBE)
Practical case studies (texts, videos) from the working world with a focus on Germany-France
Introduction to intercultural competence
Reflections/exercises on own cultural imprint

[*updated 08.01.2024*]

Teaching methods/Media:
Lecturer presentations
(Interactive) exercises and case studies
Group work
Digital content via Moodle

[*updated 08.01.2024*]

Recommended or required reading:
General literature recommendations for this module:

Barmeyer, Christoph: Taschenlexikon Interkulturalität. Vandenhoeck & Ruprecht, Göttingen, neueste Auflage.
Breuer, Jochen Peter/de Bartha, Pierre: Deutsch-Französische Geschäftsbeziehungen erfolgreich managen. Spielregeln für die Zusammenarbeit auf Führungs- und Fachebene. Deutscher Wirtschaftsdienst, Köln, neueste Auflage.
Meyer, Erin: The Culture Map. Decoding how people think, lead, and get things done across cultures. Public Affairs, New York, neueste Auflage.
Schroll-Machl, Sylvia (2003): Doing Business with Germans. Their perception, our perception. Göttingen: Vandenhoeck & Ruprecht.
Untereiner, Gilles : Le Marché Allemand: Bien connaître les Allemands pour mieux travailler avec eux. Maxima, Paris, neueste Auflage.

Spezifische Literatur + Material wird im Kurs zur Verfügung gestellt.

[*updated 08.01.2024*]

Intercultural Management 4

Module name (EN): Intercultural Management 4

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-404

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

ECTS credits:
2

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:
Written exam 60%, presentation 40% Each exam must be passed on its own.

[*updated 08.01.2024*]

Applicability / Curricular relevance:

DFBME-404 (P610-0322) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course
DFBME-404 (P610-0322) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 4, mandatory course

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):
DFBME-304 Intercultural Management 3

[*updated 21.06.2024*]

Recommended as prerequisite for:

Module coordinator:
Dr. Julia Frisch

Lecturer: Dr. Julia Frisch

[*updated 28.04.2023*]

Learning outcomes:
After successfully completing this module, students will be able to:
- explain intercultural competence models and apply and transfer them to various professional activities and environments
- explain critical incidents from multicultural everyday and professional situations with regard to intercultural differences and propose solutions
- use case studies from different contexts to work out individual cultural differences and peculiarities for themselves
- explain strategies for building and working in multicultural teams and apply them to case studies
- put leadership, team and management styles in an (inter)cultural context
- critically question their own cultural imprint with regard to communication and conflict resolution in exercises/simulations

[*updated 08.01.2024*]

Module content:

Case studies from professional practice
Team building and work cultures in multicultural teams and projects
Intercultural competence models for different professional fields
Leadership and management styles
Culture shock, international assignments, global assignments
International contrast examples (not limited to Germany and France)
Multi-perspectivity and synergy potential in a multicultural working environment

[*updated 08.01.2024*]

Teaching methods/Media:

Lecturer presentations
(Interactive) exercises and case studies
Group work
Digital content via moodle

[*updated 08.01.2024*]

Recommended or required reading:
General literature recommendations for this module:

Barmeyer, Christoph: Konstruktives interkulturelles Management. Vandenhoeck & Ruprecht, Göttingen, über utb, neueste Auflage.
Heringer, Hans-Jürgen: Interkulturelle Kommunikation. Grundlagen und Konzepte. utb, neueste Auflage.
Meyer, Erin: The Culture Map. Decoding how people think, lead, and get things done across cultures. Public Affairs, New York, neueste Auflage.
Schroll-Machl, Sylvia: Doing Business with Germans. Their perception, our perception. Göttingen: Vandenhoeck & Ruprecht, neueste Auflage.

Spezifische Literatur + Material wird im Kurs zur Verfügung gestellt.

[*updated 08.01.2024*]

Materials Technology

Module name (EN): Materials Technology

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-316

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

ECTS credits:
5

Semester: 3

Mandatory course: yes

Language of instruction:
German

Assessment:
Written exam, 120 min.; Participation in 5 laboratory experiments and 2 small group exercises

[*updated 16.11.2023*]

Applicability / Curricular relevance:

DFBME-316 (P610-0630) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 3, mandatory course
DFBME-316 (P610-0630) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , 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):
None.

Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Moritz Habschied

Lecturer: Prof. Dr. Moritz Habschied

[*updated 28.04.2023*]

Learning outcomes:
After successfully completing this module, students will be familiar with the main material groups and will be able to describe the interrelationships between materials, manufacturing and components with a focus on the structural materials used in mechanical engineering.
They will be able to recognize the relationships between atomic solid structure, microscopic observations, and material properties.
They will be familiar with the tensile test, hardness test methods and the charpy impact test and will be able to determine and interpret the corresponding characteristic values. They will be able to attribute specific material behavior to the respective microstructure.
They will be able to assess material properties and derive the resulting possible uses.
In practical exercises, they will learn to work in teams to acquire new knowledge and to work on interdisciplinary tasks. They will be able to reflect their opinions and defend them with factual arguments.

[*updated 16.11.2023*]

Module content:
- Main groups of materials

- Structural description of solids
 o Types of bonds
 o Lattice structures
 o Perturbation-free and -contaminated crystals
- Mechanical material behavior
- Alloy theory
- Influence of materials on production technology

[*updated 16.11.2023*]

Teaching methods/Media:
Lecture (3 Hours per semester week (=45 UE)): Seminaristic instruction
Exercise (1 hour per semester week (=15 UE)): lab experiments/exercises in the lecture hall on the following topics: Tensile testing (lab), Charpy impact test (lab), Hardness test (lab), Jominy end-quench test (lab), Hardening of aluminum alloys (lab), iron-carbon phase diagram (exercise), steel heat treatment (exercise)

[*updated 16.11.2023*]

Recommended or required reading:
- Bargel/Schulze: Werkstoffkunde , Springer-Verlag, Berlin, Heidelberg, New York, 12. bearb. Auflage 2018
- Weißbach W., Dahms M., Jaroschek C.: Werkstoffe und ihre Anwendungen: Metalle, Kunststoffe und mehr , Springer Vieweg; 20., überarb. Auflage 2018
- Hornbogen E., Eggeler G. und Werner E.: Werkstoffe: Aufbau und Eigenschaften von Keramik-, Metall-, Polymer- und Verbundwerkstoffen, Springer-Verlag
- Läpple, V.: Wärmebehandlung des Stahls , Verlag Europa-Lernmittel, Haan-Gruiten, 11. aktualisierte Auflage 2014
- Läpple, V., Kammer, C., Steuernagel, L.: Werkstofftechnik Maschinenbau , Verlag Europa-Lernmittel, Haan-Gruiten, 6. Auflage 2017
- Greven, E., Magin, W.: Werkstoffkunde und Werkstoffprüfung für technische Berufe , Verlag Handwerk und Technik; 18. Auflage 2015

[*updated 16.11.2023*]

Metrology and Control Eingineering + Lab

Module name (EN): Metrology and Control Eingineering + Lab

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-418

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

ECTS credits:
5

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:
Written exam (50%,), lab (50%)

[*updated 30.10.2023*]

Applicability / Curricular relevance:

DFBME-418 (P610-0632, P610-0633) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , 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):
None.

Recommended as prerequisite for:

Module coordinator:
Prof. Dr.-Ing. Thomas Heinze

Lecturer:
Prof. Dr.-Ing. Thomas Heinze

[*updated 21.01.2025*]

Learning outcomes:
In this module, students will acquire basic knowledge in the field of conventional metrology and control technology and understand how to implement basic functional setups. They will be familiar in particular with measuring methods for measuring displacement, strain, force, accelerations, rotational speed, torque, pressure, flow rate, temperature, current, voltage, resistances and will be able to assess their properties and set up and operate said measuring equipment independently.
Students will be proficient in the practical selection of controllers and their settings. They will be familiar with the design and setting of control loops.

[*updated 30.10.2023*]

Module content:
Principles of metrology
- Fundamental requirements
- Units
- Measuring systems
- Measurement errors

Components of measuring equipment
- Sensors
- Devices for converting measured variables
- Devices for processing measured variables
- Devices for the output of measured variables

- Devices for storing measured variables
Measurement methods
- Measuring mechanical quantities
- Flow rate measurement
- Measuring thermal quantities

Introduction to the principles and basic concepts of control engineering
Control system elements and signal flow diagrams
The static and dynamic behavior of control loops, command and disturbance transfer behavior
Design, adjustment and optimization of controllers in the time domain Setting control loops according to Ziegler-Nicols, Chiens, Hrones, Reswick

[*updated 30.10.2023*]

Teaching methods/Media:
Lecture with integrated exercises, lab experiments in small groups

[*updated 30.10.2023*]

Recommended or required reading:
Taschenbuch der Messtechnik, Jörg Hoffmann, ISBN: 9783446409934
Meßtechnik an Maschinen und Anlagen, Heinz Stetter (Hrsg.), ISBN: 9783519063261
Grundriss der praktischen Regelungstechnik, Samal et al. ISBN: 9783486236354

[*updated 30.10.2023*]

Numerical Mathematics and Numerical Simulation

Module name (EN): Numerical Mathematics and Numerical Simulation

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-412

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

ECTS credits:
5

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:
Written exam 120 min.

[*updated 30.09.2020*]

Applicability / Curricular relevance:

DFBME-412 (P610-0331, P610-0549, P610-0570, P610-0571) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course
DFBME-412 (P610-0331, P610-0549, P610-0570, P610-0571) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 4, mandatory course
EE-K2-540 Energy system technology / Renewable energies, Bachelor, ASPO 01.04.2015 , semester 5, optional course, engineering
FT18 (P241-0094, P241-0095) Automotive Engineering, Bachelor, ASPO 01.10.2011 , semester 4, mandatory course
FT18 (P241-0094, P241-0095) Automotive Engineering, Bachelor, ASPO 01.10.2015 , semester 4, mandatory course
FT18 (P241-0094, P241-0095) Automotive Engineering, Bachelor, ASPO 01.04.2016 , semester 4, mandatory course
FT18 (P241-0094, P241-0095) Automotive Engineering, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course
MAB.4.1.NMS (P241-0094, P241-0095) Mechanical and Process Engineering, Bachelor, ASPO 01.10.2013 , 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):
None.

Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Marco Günther

Lecturer: Prof. Dr. Marco Günther

[*updated 28.04.2023*]

Learning outcomes:
After successfully completing this course, students will:
- solve fundamental problems using the principles of numerics and standard numerical methods
- use their newly acquired practical knowledge in problem solving to engineer simulations of dynamic systems
- be able to use MATLAB
- develop calculation programs
- program and use MATLAB script files and Simulink model files

[*updated 30.09.2020*]

Module content:
Linear algebra: Definition of linear systems of equations, Application examples in engineering, Numerical solution methods: direct solvers, iterative solvers
Nonlinear equations: Determining a zero point, Nonlinear systems

Introduction to Matlab using a computer
Interpolation: Newton polynomials, Spline functions
Approximation (linear discrete Gaussian approximation)
Numerical differentiation and integration
Ordinary differential equations: Initial value problems, boundary value problems
Introduction to Simulink on the computer

[*updated 30.09.2020*]

Teaching methods/Media:
Lecture notes, PowerPoint presentation/handouts, exercises

[*updated 30.09.2020*]

Recommended or required reading:
- Bartsch H.-J.: Taschenbuch Mathematischer Formeln
- Beucher O.: MATLAB und Simulink
- Faires J.D., Burden R.L.: Numerische Methoden
- Schwarz H.R., Köckler N.: Numerische Mathematik

[*updated 30.09.2020*]

Project work

Module name (EN): Project work

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-602

Hours per semester week / Teaching method:
3PA (3 hours per week)

ECTS credits:
6

Semester: 6

Mandatory course: yes

Language of instruction:
German

Assessment:
Written report and oral presentation

[*updated 25.05.2021*]

Applicability / Curricular relevance:

DFBME-602 (P610-0348) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 6, mandatory course

DFBME-602 (P610-0348) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 6, mandatory course

Workload:
45 class hours (= 33.75 clock hours) over a 15-week period.
The total student study time is 180 hours (equivalent to 6 ECTS credits).
There are therefore 146.25 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. Heike Jaeckels

Lecturer:
Prof. Dr.-Ing. Heike Jaeckels

[*updated 06.12.2024*]

Learning outcomes:

[*still undocumented*]

Module content:

[*still undocumented*]

Recommended or required reading:

[*still undocumented*]

Project, Presentation and Report

Module name (EN): Project, Presentation and Report

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-411

Hours per semester week / Teaching method:
1CM+2PA

ECTS credits:
3

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:
Project report (70%), feedback discussion (passed/failed), and oral presentation (30%)

[*updated 08.08.2024*]

Applicability / Curricular relevance:

DFBME-411 (P610-0333, P610-0346) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course
DFBME-411 (P610-0333, P610-0346) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 4, mandatory course

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

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Prof. Dr.-Ing. Heike Jaeckels

Lecturer: Prof. Dr.-Ing. Heike Jaeckels

[*updated 28.04.2023*]

Learning outcomes:
After successfully completing this module, students will:
be able to formulate a question from the field of mechanical engineering and derive a topic for a project from it.
be able to sift through, understand, analyze, assess and summarize the literature on said topic
be able to present the project and its results in writing in the form of a technical report
be able to prepare an oral presentation
be able to present and discuss the project, the approach and the main results orally to a specialist audience
Students will be familiar with and be able to correctly implement:
efficient time management
teamwork and organization methods, where applicable

[*updated 08.08.2024*]

Module content:
1. Acquiring knowledge
2. Specifications for a project
3. Presentation techniques
4. Creating reports

[*updated 08.08.2024*]

Recommended or required reading:
Balzert H. et al. : Wissenschaftliches Arbeiten, W3L, Dortmund, ²2104
Ebel H.F. et al. : Erfolgreich kommunizieren, Wiley-VCH, Weinheim, 2000
Kornmeier, M. : Wissenschaftlich schreiben leicht gemacht, Haupt, Bern, 2008
Prevezanos C. : Technisches Schreiben, Hanser, München, 2013
Rost F. : Lern- und Arbeitstechniken, VS Verlag, Wiesbaden, 4. Auflage,2004
Stickel- Wolf C., Wolf J., : Wissenschaftliches Arbeiten und Lerntechniken, Gabler Verlag, Wiesbaden, 5. Auflage, 2009
Theisen R.M. : Wissenschaftliches Arbeiten, Vahlen, München, 2013

[*updated 08.08.2024*]

Thermodynamics

Module name (EN): Thermodynamics

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-407

Hours per semester week / Teaching method:
4SU+2U (6 hours per week)

ECTS credits:
5

Semester: 4

Mandatory course: yes

Language of instruction:
German

Assessment:
Written exam (graded)

[*updated 16.11.2023*]

Applicability / Curricular relevance:

DFBME-407 (P610-0341, P610-0547) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 4, mandatory course
DFBME-407 (P610-0341, P610-0547) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 4, mandatory course

Workload:
90 class hours (= 67.5 clock hours) over a 15-week period.

The total student study time is 150 hours (equivalent to 5 ECTS credits).
There are therefore 82.5 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Dr. Olivia Freitag-Weber

Lecturer:
Dr. Olivia Freitag-Weber

[*updated 15.01.2025*]

Learning outcomes:
After successfully completing this module, students will:
* be familiar with the basic physical laws of thermodynamics, in particular the influence of mechanical work and, in contrast, that of heat and its entropy.
* be familiar with and able to apply thermodynamic state variables and their relationship in the equations of state for an ideal gas, as well as for real gases and wet steam processes.
* be able to apply their theoretical knowledge to practical examples from energy technology such as compressors and turbines, heat engines, heat pumps, reciprocating engines, etc. and to evaluate the different levels of efficiency.

[*updated 16.11.2023*]

Module content:
* Introduction of thermal (= volume, pressure, temperature) and energetic (= internal energy, enthalpy and entropy) state variables and their equations of state for the general fluid.
* Introduction of the process variables work and heat
* 1st and 2nd law of thermodynamics
* Simple changes of state of an ideal gas
* Properties of real gas as wet vapor and in the 3 states of aggregation
* Circular processes of an ideal gas: Carnot, Joule, Ackeret-Keller process, gasoline, diesel and Stirling engine with improvements such as reheating and multi-stage compressors and turbines
* Circular processes of a real gas: Clausius - Rankine and ORC process

[*updated 16.11.2023*]

Teaching methods/Media:
Lecture and tutorials

[*updated 16.11.2023*]

Recommended or required reading:
Cerbe-Wilhelms: Technische Thermodynamik, Hanser-Verlag
Linow: Angewandte technische Thermodynamik, Hanser-Verlag
Löser, Klemm, Hiller: Technische Thermodynamik, Hanser-Verlag

[*updated 16.11.2023*]

Work Experience Phase

Module name (EN): Work Experience Phase

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-601

Hours per semester week / Teaching method:
-

ECTS credits:
9

Semester: 6

Mandatory course: yes

Language of instruction:
German

Assessment:

[*updated 08.08.2024*]

Applicability / Curricular relevance:

DFBME-601 (S610-0347) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , semester 6, mandatory course
DFBME-601 (S610-0347) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 6, mandatory course

Workload:
The total student study time for this course is 270 hours.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Studienleitung

Lecturer:
Prof. Dr.-Ing. Heike Jaeckels

[*updated 24.11.2024*]

Learning outcomes:
After successfully completing this module, students will be able to integrate themselves into a company, grasp its processes and communicate in this environment in an appropriate manner and in the company language.
They will be able to take on clearly defined tasks from their field of study and successfully complete them within a given timeframe. The tasks assigned to them will be the same as those that would be assigned to an entry-level professional.
Students will be able to apply the specialist knowledge acquired during their studies.

[*updated 08.08.2024*]

Module content:
The work experience phase is an integral part of the study program and is carried out over a period of 10 weeks (without vacation). It is to be completed in a company active in the field of the student´s degree program.

The internship location should be located somewhere where the student´s partner language is spoken, and the main language spoken in the company should also be the partner language.

The company will designate a qualified person to support the student during their internship.
The student will sign an internship contract with the company. Prior to concluding the contract, students must obtain written approval from their German study program director.

[*updated 08.08.2024*]

Teaching methods/Media:
Practical relevance

[*updated 08.08.2024*]

Recommended or required reading:
None

[*updated 08.08.2024*]

Mechanical Engineering Bachelor - optional courses

Spanish 3

Module name (EN): Spanish 3

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-306

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

ECTS credits:
4

Semester: 3

Mandatory course: no

Language of instruction:
Spanish

Assessment:
Written exam (50%) + presentation (25%) + tests (25%)

[*updated 08.01.2024*]

Applicability / Curricular relevance:

DFBEES-313 (P610-0624) Electrical Engineering - Renewable Energy and System Technology, Bachelor, ASPO 01.10.2019 , optional course
DFBME-306 (P610-0334, P610-0631) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , mandatory course
DFBME-306 (P610-0334, P610-0631) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 3, optional course
DFITM-315 (P620-0634) International Tourism Management, Bachelor, ASPO 01.10.2020 , semester 3, optional course
DFIW-306 (P610-0626) Computer Science and Web Engineering, Bachelor, ASPO 01.10.2019 , semester 3, optional course
DFILM-308 (P620-0632) International Logistics Management, Bachelor, ASPO 01.10.2022 , semester 3, optional course
DFIM-315 (P620-0630) German-French and International Management, Bachelor, ASPO 01.10.2019 , semester 3, optional course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 120 hours (equivalent to 4 ECTS credits).
There are therefore 75 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Dr. Julia Frisch

Lecturer:
Dozierende des Studiengangs

[*updated 21.06.2024*]

Learning outcomes:
The initial level is A2.

After successfully completing this module, students will:
be able to understand simple and clear standard language in written and spoken form
be able to talk about familiar topics from their studies, work and leisure time
be able to express themselves simply and coherently on familiar topics and personal areas of interest
be able to outline the goals of their studies and describe their professional and technical plans for the future
be able to talk about current affairs

[*updated 08.01.2024*]

Module content:
Repetition and consolidation of past tenses and their use (perfecto/indefinido)
Introduction of future tenses (futuro proximo + futuro simple)
Introduction of the subjunctive
Speaking and writing about professional and private future plans, wishes and experiences
Speaking and writing about simple news, political and social issues
Describing simple graphics and diagrams
Culture, geography and history of Spanish-speaking countries

[*updated 08.01.2024*]

Teaching methods/Media:
The learning content is developed in a communicative and action-oriented manner with targeted listening, reading and speaking exercises in individual, partner and group work. A subject-related presentation on the course content is obligatory.
Short written or oral progress tests are a component of the course.

[*updated 08.01.2024*]

Recommended or required reading:
Multimedia-supported teaching and learning material to intensify teaching will be provided in the course and via Moodle.

[*updated 08.01.2024*]

Spanish 4

Module name (EN): Spanish 4

Degree programme: Mechanical Engineering, Bachelor, ASPO 01.10.2024

Module code: DFBME-408

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

ECTS credits:
4

Semester: 4

Mandatory course: no

Language of instruction:
Spanish

Assessment:
Written exam (50%) + presentation (25%) + tests (25%)

[*updated 08.01.2024*]

Applicability / Curricular relevance:

DFBEES-412 (P610-0077, P610-0625) Electrical Engineering - Renewable Energy and System Technology, Bachelor, ASPO 01.10.2019 , optional course
DFBME-408 (P610-0343, P610-0628) Mechanical Engineering, Bachelor, ASPO 01.10.2019 , mandatory course
DFBME-408 (P610-0343, P610-0628) Mechanical Engineering, Bachelor, ASPO 01.10.2024 , semester 4, optional course
DFITM-409 (P620-0635) International Tourism Management, Bachelor, ASPO 01.10.2020 , semester 4, optional course
DFIW-406 (P610-0627) Computer Science and Web Engineering, Bachelor, ASPO 01.10.2019 , semester 4, optional course
DFILM-418 (P620-0633) International Logistics Management, Bachelor, ASPO 01.10.2022 , semester 4, optional course
DFIM-416 (P620-0631) German-French and International Management, Bachelor, ASPO 01.10.2019 , semester 4, optional course

Workload:
60 class hours (= 45 clock hours) over a 15-week period.
The total student study time is 120 hours (equivalent to 4 ECTS credits).
There are therefore 75 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Dr. Julia Frisch

Lecturer:
Dozierende des Studiengangs

[*updated 21.06.2024*]

Learning outcomes:
The initial level is A2+/B1, the targeted level B1+.

After successfully completing this module, students will:

be able to reproduce content from films, articles and interviews
be able to understand and make suggestions for organizing their leisure time and work and will be able to reject and accept them
be able to create their own graphics and tables
be able to extract arguments and justifications from discussions (audio/video/simulations) and use them in pro/con arguments to express their own position
be able to write their own short fictional texts

[*updated 08.01.2024*]

Module content:
The content builds on that of Spanish 3.
Consolidating the subjunctive + using subjunctive tenses
Indirect speech
Conditional sentences with si, relative pronouns
Reciprocal verbs
Formulating descriptions, content renditions, interpretations
The ability to extract meaning from simple fictional texts, newspaper articles and factual texts
Regional studies: The history of Spain and the Spanish-speaking world

[*updated 08.01.2024*]

Teaching methods/Media:
The learning content is developed in a communicative and action-oriented manner with targeted listening, reading and speaking exercises in individual, partner and group work. A subject-related presentation on the course content is obligatory.
Short written or oral progress tests are a component of the course.

[*updated 08.01.2024*]

Recommended or required reading:
Multimedia-supported teaching and learning material to intensify teaching will be provided in the course and via Moodle.

[*updated 08.01.2024*]