Course Handbook Automotive Engineering

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Head of Studies	Prof. Dr. Hans-Werner Groh
Deputy Head of Studies	Prof. Dr.-Ing. Rüdiger Tiemann
Chairman of Examination	Prof. Dr. Jörg Hoffmann
Deputy Chairman of Examination	Prof. Dr.-Ing. Thomas Heinze

Automotive Engineering - mandatory courses (overview)

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

(0 modules)

Automotive Engineering - optional courses (overview)

Module name (EN)	Code	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator
Basic Principles Governing the Qualification of Trainers and Instructors in Germany's Dual Education and Vocational Training System	FT63	5	2V	2	Prof. Dr.-Ing. Dietmar Brück
Electromobility	FT62	6	2V	3	Prof. Dr. Horst Wieker

(2 modules)

Automotive Engineering - mandatory courses

Automotive Engineering - optional courses

Basic Principles Governing the Qualification of Trainers and Instructors in Germany’s Dual Education and Vocational Training System

Module name (EN): Basic Principles Governing the Qualification of Trainers and Instructors in Germany´s Dual Education and Vocational Training System
Degree programme: Automotive Engineering, Bachelor, ASPO 01.10.2019
Module code: FT63
Hours per semester week / Teaching method: 2V (2 hours per week)
ECTS credits: 2
Semester: 5
Mandatory course: no
Language of instruction: German
Assessment: Written exam

Curricular relevance:
E1582 Electrical Engineering, Bachelor, ASPO 01.10.2012, optional course
EE-K2-546 Energy system technology / Renewable energies, Bachelor, ASPO 01.04.2015, optional course, engineering
FT63 Automotive Engineering, Bachelor, ASPO 01.04.2016, semester 5, optional course, technical
FT63 Automotive Engineering, Bachelor, ASPO 01.10.2019, semester 5, optional course, technical
KI611 Computer Science and Communication Systems, Bachelor, ASPO 01.10.2014, semester 6, optional course, non-technical
KIB-AUSB Computer Science and Communication Systems, Bachelor, ASPO 01.10.2017, semester 6, optional course, non-technical
MAB.4.2.1.20 Mechanical and Process Engineering, Bachelor, ASPO 01.10.2013, semester 4, optional course
MST.GAU Mechatronics and Sensor Technology, Bachelor, ASPO 01.10.2012, optional course, non-technical
MST.GAU Mechatronics and Sensor Technology, Bachelor, ASPO 01.10.2019, optional course, non-technical
PIBWN66 Applied Informatics, Bachelor, ASPO 01.10.2011, semester 6, optional course, not informatics specific
PIB-AUSB Applied Informatics, Bachelor, ASPO 01.10.2017, semester 6, optional course, not informatics specific
MST.GAU Mechatronics and Sensor Technology, Bachelor, ASPO 01.10.2011, optional course, non-technical

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

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Prof. Dr.-Ing. Dietmar Brück

Lecturer: Prof. Dr.-Ing. Dietmar Brück
[*updated 13.01.2019*]

Learning outcomes:
After successfully completing this module, students will be familiar with the legal regulations that apply to vocational training and can implement them responsibly. They will have all of the knowledge necessary for the successful completion of the instructor qualification test at the Chamber of Industry and Commerce (IHK). Students will be capable of training young people in a company in accordance with legal, technical and organizational guidelines and helping their trainees successfully complete their training.
[*updated 26.02.2018*]

Module content:
- Planning and testing vocational training requirements
- Preparing vocational training and participating in the recruitment of trainees
- Carrying out vocational training
- Completing vocational training
[*updated 19.02.2018*]

Teaching methods/Media:
Transparencies
[*updated 19.02.2018*]

Recommended or required reading:
Ausbilder-Eignungsverordnung, Rahmenplan mit Lernzielen, Publisher: DIHK - Deutscher Industrie- und Handelskammertag e. V., Berlin 2009
[*updated 19.02.2018*]

Electromobility

Module name (EN): Electromobility
Degree programme: Automotive Engineering, Bachelor, ASPO 01.10.2019
Module code: FT62
Hours per semester week / Teaching method: 2V (2 hours per week)
ECTS credits: 3
Semester: 6
Mandatory course: no
Language of instruction: German
Assessment:
Curricular relevance: FT62 Automotive Engineering, Bachelor, ASPO 01.04.2016, semester 6, optional course, specialisation FT62 Automotive Engineering, Bachelor, ASPO 01.10.2019, semester 6, optional course, specialisation KI617 Computer Science and Communication Systems, Bachelor, ASPO 01.10.2014, semester 6, optional course, technical KIB-EMOB Computer Science and Communication Systems, Bachelor, ASPO 01.10.2017, semester 6, optional course, technical PIBWI59 Applied Informatics, Bachelor, ASPO 01.10.2011, semester 6, optional course, informatics specific PIB-EMOB Applied Informatics, Bachelor, ASPO 01.10.2017, semester 6, optional course, informatics specific
Workload: 30 class hours (= 22.5 clock hours) over a 15-week period. The total student study time is 90 hours (equivalent to 3 ECTS credits). There are therefore 67.5 hours available for class preparation and follow-up work and exam preparation.

Recommended prerequisites (modules):
None.

Recommended as prerequisite for:

Module coordinator:
Prof. Dr. Horst Wieker

Lecturer: Prof. Dr. Horst Wieker
[*updated 13.01.2019*]

Learning outcomes:
After successfully completing this module, students will understand new and adapted vehicle systems and be able to describe different market requirements against the background of market trends. They will be able to characterize the functional structure of the systems and their interfaces and identify solutions to typical problems.
[*updated 26.02.2018*]

Module content:
This course will focus on trends, technology and system networking in and outside of vehicles.

The electrification of the automobile occupies a strong position in the global market. The transition from the combustion engine to pure electric driving have led to a wide range of new systems and information networks in vehicles.

This course will deal with the following questions:
* What are the main differences between a vehicle with an internal combustion engine and a hybrid or electric car and what effects do these differences have on the function development?
* How do electronic systems and networks work in an electric car?
* Are there special functional requirements for assistance systems in electric vehicles?
* What do the data networks look like in the future vehicles and what requirements do they have to meet?

1. General information on market trends and their technical requirements
  * User behavior
  * Political influences
2. General technical principles
  * Gasoline engines
  * Diesel engines
  * Hybrid vehicles
  * Electric vehicles
3. The architecture of electric vehicles
  * Drive systems
  * Chassis & safety systems
  * Vehicle cabin systems
  * High-voltage architectures
4. Driver assistance systems
  * Overview of functionalities and networks
  * Limits of driver assistance systems
5. Communication systems inside and outside vehicles
  * ITS and electric vehicles
  * Data networks
6. Functional safety
  * General requirements for security and privacy
  * Redundancies
  * Requirements for assistance and security systems
  * Road vehicles - Functional safety ISO 26262

[*updated 26.02.2018*]

Recommended or required reading:
[*still undocumented*]