Karlsruher Institut für Technologie

Module Handbook
Mechanical Engineering (International) Bachelor

SPO 2017
Winter Term 18/19
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Part I
Modules

1 Orientation Exam

M Module: Orientation Exam [M-MACH-104162]

Responsibility:

Organisation: Universität gesamt
Curricular Anchorage: Compulsory
Contained in: Orientation Exam

ECTS	Recurrence	Duration	Language	Version
0	Each term	2 terms	German	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-100282	Engineering Mechanics I (S. 49)	7	Thomas Böhlke, Tom-Alexander Langhoff
T-MACH-100283	Engineering Mechanics II (S. 50)	6	Thomas Böhlke, Tom-Alexander Langhoff
T-MATH-108266	Advanced Mathematics I (S. 33)	7	Maria Aksenovich, Stefan Kühnlein

2 Bachelor Thesis

M Module: Bachelor Thesis [M-MACH-103722]

Responsibility: Martin Heilmaier

Organisation: Werkstoffkunde
Curricular Anchorage: Compulsory
Contained in: Bachelor Thesis

ECTS	Recurrence	Duration	Language	Version
15	Each term	1 term	English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-108685	Bachelor Thesis (S. 42)	12	Martin Heilmaier
T-MACH-108684	Presentation (S. 71)	3	Martin Heilmaier

Learning Control / Examinations
The module Bachelor Thesis consists of a written bachelor thesis and an oral presentation of a scientific subject chosen by the student himself/herself or given by the supervisor. The bachelor's thesis is designed to show that the student is able to deal with a problem of his/her subject area in an independent manner and within the given period of time using scientific methods.
The work load of the bachelor thesis corresponds to 12 ECTS. The maximal processing time of the bachelor thesis takes three months.
The date of issue of the subject has to be fixed by the supervisor and the student and to be put on record at the examination board. The subject of the bachelor thesis may be only returned once and only within the first month of processing time
On a reasoned request of the student, the examination board can extend the processing time by up to one month. If the bachelor thesis is not completed in time, this examination is "failed" (5,0), unless the student is not responsible.
The bachelor thesis is to be evaluated by not less than a professor or a senior scientist according to § 14 Abs. 3 Ziff. 1 KITG and another examiner. Generally, one of the two examiners is the person who has assigned the thesis. If the examiners do not agree, the bachelor thesis is graded by the examination board within this assessment; another expert can be appointed too. The bachelor thesis has to be graded within a period of six weeks after the submission.
The colloquium presentation must be held within 6 weeks after the submission of the bachelor thesis. The presentation should last around 20 minutes, corresponds to 3 ECTS, and is followed by a scientific discussion with the present expert audience.

Conditions
The requirement for admission to the bachelor thesis module are 120 ECTS. As to exceptions, the examination board decides on a request of the student (see § 14 (1) SPO).

Qualification Objectives
The student is able to work independently on a defined, subject-relevant theme based on scientific criteria within a given period of time. The student is able to do research, to analyze information, to abstract as well as collect and recognize basic principles and regularities on the basis of less structured information. He/she overviews a question, is able to choose scientific methods and techniques, and use them to solve the question or to identify other potentials. In general, this will be carried out in consideration of social and/or ethical aspects.
The student can interpret, evaluate, and if needed plot the results obtained. He/she is able to clearly structure a scientific work and (a) to communicate it in written form using technical terminology as well as (b) to present it in oral form and discuss it with experts.

Content
The student shall be allowed to make suggestions for the topic of his/her bachelor thesis. The topic is set by the supervisor

of the thesis in accordance with § 14 (3) SPO.

Workload
The workload for the preparation and presentation of the bachelor thesis is about 450 hours.

3 Fundamentals of Engineering

M Module: Advanced Mathematics [M-MATH-104022]

Responsibility: Maria Aksenovich, Stefan Kühnlein

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory

Contained in: Fundamentals of Engineering

ECTS	Recurrence	Duration	Language	Version
21	Each winter term	3 terms	English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-108266	Advanced Mathematics I (S. 33)	7	Maria Aksenovich, Stefan Kühnlein
T-MATH-108268	Advanced Mathematics II (S. 35)	7	Maria Aksenovich, Stefan Kühnlein
T-MATH-108270	Advanced Mathematics III (S. 37)	7	Maria Aksenovich, Stefan Kühnlein
T-MATH-108265	Advanced Mathematics I Prerequisite (S. 34)	0	Maria Aksenovich, Stefan Kühnlein
T-MATH-108267	Advanced Mathematics II Prerequisite (S. 36)	0	Maria Aksenovich, Stefan Kühnlein
T-MATH-108269	Advanced Mathematics III Prerequisite (S. 38)	0	Maria Aksenovich, Stefan Kühnlein

Learning Control / Examinations
Three written exams for the parts I-III of length 120 minutes each.

Module Grade
The grade for the module is composed from equally weighted grades for the examinations in Advanced Mathematics I-III.

Conditions
None.

Qualification Objectives
The students know the foundations of calculus of one and several variables, linear algebra, theory of differential equations, and probability theory. They know and can apply techniques in these fields.

Content
Basic set theoretic notions, proofs, sequences and convergence, functions and continuity, series, derivatives, integrals, vector spaces, matrices, Laplace transform, functions of several variables, applications of multivariate calculus, Fourier analysis, differential equations, probability.

Literature

- Lecture notes
- K. F. Riley, M. P. Hobson, S. J. Bence "Mathematical methods for physics and engineering", Cambridge University Press, 2015

Workload
In class: 270 hours

- lectures, tutorials and examinations

Independent study: 360 hours

- independent review of course material
- work on homework assignments
- preparation for written exams

M Module: Engineering Mechanics (BSc-Modul 03, TM) [M-MACH-102572]

Responsibility: Thomas Böhlke, Wolfgang Seemann

Organisation: Institut für Technische Mechanik

Curricular Anchorage: Compulsory

Contained in: Fundamentals of Engineering

ECTS	Recurrence	Duration	Language	Version
23	Each winter term	4 terms	German/English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-100282	Engineering Mechanics I (S. 49)	7	Thomas Böhlke, Tom-Alexander Langhoff
T-MACH-100283	Engineering Mechanics II (S. 50)	6	Thomas Böhlke, Tom-Alexander Langhoff
T-MACH-105201	Engineering Mechanics III & IV (S. 51)	10	Wolfgang Seemann
T-MACH-100528	Tutorial Engineering Mechanics I (S. 77)	0	Thomas Böhlke, Tom-Alexander Langhoff
T-MACH-100284	Tutorial Engineering Mechanics II (S. 78)	0	Thomas Böhlke, Tom-Alexander Langhoff
T-MACH-105202	Tutorial Engineering Mechanics III (S. 79)	0	Wolfgang Seemann
T-MACH-105203	Tutorial Engineering Mechanics IV (S. 80)	0	Wolfgang Seemann

Learning Control / Examinations
prerequisites EM I, II (see T-MACH-100528 "Engineering Mechanics I (Tutorial)" as well as T-MACH-100284 "Engineering Mechanics II (Tutorial)"): they consist of solving problems of the work sheets in four categories: written mandatory homework, written homework, computational homework, colloquia.
prerequisites EM III, IV
"Engineering Mechanics I", written exam, 90 minutes; graded:
"Engineering Mechanics II", written exam, 90 minutes; graded;
"Engineering Mechanics III/IV", written exam, 180 Minutes; graded;
The final grade of this module is computed as ECTS-based weighted sum of the included exams.

Conditions
None

Qualification Objectives
After having finished the lectures EM I and EM II the students can

- assess stress and strain distributions for the basic load cases within the framework of elasticity and thermoelasticity
- compute and evaluate 3D stress and strain states
- apply the principle of virtual displacements
- apply energy methods and evaluate approximate solutions
- evaluate the stability of equilibrium positions
- solve worksheet problems to topics of the lecture using the computer algebra system MAPLE

In EM III and EM IV the students learn to analyse the motion of points and systems. Based on the axioms of Newton and Euler they know how to derive equations of motion. Besides the synthetic methods they get familiar with analytical methods which are based on energy expressions and can be applied efficiently and formalised. These methods are introduced in the scope of systems of mechanical engineering so that students can determine and analyse motions and the forces which are generated by these motions.

Content
This Module consists of the courses "Engineering Mechanics I (lecture)" up to "Engineering Mechanics IV (lecture)" as well as "Engineering Mechanics I (Tutorial)" up to "Engineering Mechanics IV (Tutorial)"
Contents of "Engineering Mechanics I": basics of vector calculus; force systems; statics of rigid bodies; internal forces and moments in bars and beams; friction; centre of gravity, centre of mass; work, energy, principle of virtual work; statics of inextensible ropes; elastostatics of tension-compression-bars
Contents of "Engineering Mechanics II": bending; shear; torsion; stress and strain state in 3D; Hooke's law in 3D; elasticity theors in 3D; energy methods in elastostatics; approximation methods; stability
Contents of "Engineering Mechanics III":
Kinematics: Cartesian, cylindrical and natural coordinates. Time derivatives in moving reference frames, angular velocities of reference frames.
Kinetics of a particle:
Newton's axiom, Principle of d'Alembert, work of a force, kinetic and potential energies, principle of linear momentum, principle of moment of momentum, kinetics in moving reference systems
Systems of particles:
Principle of center of mass, Principle of moment of momentum, impacts between particles, systems with variable mass, applications.
Plain motion of rigid bodies:
Pure translation, pure rotation, general plain motion. Instantaneous center of rotation, Kinetics, moment of momentum, principle of work and principle of energy conservation for a rotation around a space-fixed axis. Mass moment of inertia, parallel-axis-theorem.Principle of linear momentum and principle of moment of momentum for arbitrary plain motion. Principle of d'Alembert for plain motion. Principles of linear and moment of momentum in integral form. Applications for impact problems.
Contents of "Engineering Mechanics IV":
Spatial kinematics of a rigid body, Euler angles, angular velocity using Euler angles, Euler's equations, inertia tensor, kinetic energy of a rigid body, free gyroscopes, forced gyroscopes, systems of rigid bodies, principle of d'Alembert, Lagrange's equations of the first and second kind, generalized coordinates, free and forced vibration of one degree of freedom systems, frequency response, vibration of multi degree of freedom systems, vibration absorption

Remarks
For the Bachelor's program Mechanical Engineering the module (including all brick details, exams and courses) is offered in German.
For the Bachelor's program Mechanical Engineering (International) the module (including all brick details, exams and courses) is offered in English.

Workload
lectures and exercises: 204h
homework and preparation of examination: 486h

M Module: Manufacturing Processes (MEI) [M-MACH-104232]

Responsibility: Volker Schulze, Frederik Zanger

Organisation: KIT-Fakultät für Maschinenbau

Curricular Anchorage: Compulsory

Contained in: Fundamentals of Engineering

ECTS	Recurrence	Duration	Language	Version
4	Each winter term	1 term	English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-108747	Basics of Manufacturing Technology (MEI) (S. 44)	4	Volker Schulze, Frederik Zanger

Learning Control / Examinations
written exam (duration: 60 min)

Conditions
none

Qualification Objectives
The students ...

- are able to classify the manufacturing processes by their general functionality according to the specific main groups (DIN 8580).
- have the ability to declare and explain the function of the significant manufacturing processes of the main groups (DIN 8580).
- are enabled to describe the characteristic process features (geometry, materials, accuracy, tools, machines) of the significant manufacturing processes of the main groups (DIN 8580).
- have the ability to derive the relevant process specific technical advantages and disadvantages of the characteristic process features.
- are enabled to perform a selection of suitable manufacturing processes for given components.
- are enabled to classify the required manufacturing processes in the expiry of a process chain for the production of given sample products.

Content
The objective of the lecture is to classify the manufacturing technology within the wider context of production engineering, to provide an overview of the different manufacturing processes and to establish basic process knowledge of the common processes. The lecture conveys the basic principles of manufacturing technology and deals with the manufacturing processes based on example components according to their classification into main groups regarding technical and economic aspects.

The following topics will be covered:

- Primary processing (casting, plastics engineering, sintering, additive manufacturing processes)
- Forming (sheet-metal forming, massive forming)
- Cutting (machining with geometrically defined and geometrically undefined cutting edges, separating, abrading)
- Joining
- Coating
- Heat treatment and surface treatment

Workload
regular attendance: 21 hours

self-study: 99 hours

M Module: Materials Science (BSc-Modul 04, WK) [M-MACH-102562]

Responsibility: Martin Heilmaier

Organisation: Werkstoffkunde
Curricular Anchorage: Compulsory
Contained in: Fundamentals of Engineering

ECTS	Recurrence	Duration	Version
14	Each winter term	2 terms	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-105145	Materials Science I & II (S. 63)	11	Jens Gibmeier, Martin Heilmaier, Kay Weidenmann
T-MACH-105146	Materials Science Lab Course (S. 64)	3	Martin Heilmaier, Anton Möslang, Kay Weidenmann

Learning Control / Examinations
not graded: participation in 10 lab experiments, introductory colloquia must be passed and 1 short presentation must be presented. The lab course must be finished successfully prior to the registration for the oral exam;
graded: oral exam covering the whole module, 25 minutes.

Conditions
None

Qualification Objectives
Within this Module the students should

- gain knowledge of basics about structural and functional materials
- be able to draw relationships between atomic structure, microstructure and properties
- be able to assess material properties and corresponding applications

M Module: Technical Thermodynamics (BSc-Modul 05, TTD) [M-MACH-102574]

Responsibility: Ulrich Maas

Organisation: Institut für Technische Thermodynamik
Curricular Anchorage: Compulsory
Contained in: Fundamentals of Engineering

ECTS	Recurrence	Duration	Language	Version
15	Each winter term	2 terms	German/English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-104747	Technical Thermodynamics and Heat Transfer I (S. 75)	8	Ulrich Maas
T-MACH-105287	Technical Thermodynamics and Heat Transfer II (S. 76)	7	Ulrich Maas
T-MACH-105204	Excercises in Technical Thermodynamics and Heat Transfer I (S. 52)	0	Ulrich Maas
T-MACH-105288	Excercises in Technical Thermodynamics and Heat Transfer II (S. 53)	0	Ulrich Maas

Learning Control / Examinations
Prerequisite: attestation each semester by homework assignments
Thermodynamics I: Written exam, graded, 3 hours
Thermodynamics II: Written exam, graded, 3 hours

Module Grade
weight according to CP

Conditions
None

Qualification Objectives
The students acquire the competency to master the fundamentals of thermodynamics and the ability to apply the knowledge an problem-solving in various branches of mechanical engineering and especially in the Energy Technology sector.
An integral part of the model is that students can define the fundamental laws of thermodynamics and their application. The students are competent in describing and comparing the main processes in energy conversion. Using tools also applied in Industry they are capable of analysing and rating the efficiency of processes. The students are capable of discussing the thermodynamical correlation of ideal gas mixtures, real gases and of humid air as well analysing them with the help of the laws of thermodynamic. Furthermore the students are capable of defining and applying the heattransfer mechanisms.

Content
Thermodynamics I:

- System, properties of state
- Chemical and thermodynamic properties of pure components
- Absolute temperature, model systems
- 1st law of thermodynamics for resting and moved systems Entropy and 2nd law of thermodynamics
- Behavior of real substances described by tables, diagrams and equations of state
- Machine processes

Thermodynamics II:

- Repetition of the topics of "Thermodynamics and Heat Transfer I"

- Mixtures of ideal gases
- Moist air
- Behaviour of real substances described by equations of state
- Applications of the laws of thermodynamics to chemical reactions

Remarks
For the Bachelor's program Mechanical Engineering the module (including all brick details, exams and courses) is offered in German.
For the Bachelor's program Mechanical Engineering (International) the module (including all brick details, exams and courses) is offered in English.

Workload
lectures and exercises: 150h
homework and preparation of examination: 300h

M Module: Fluid Mechanics (BSc-Modul 12, SL) [M-MACH-102565]

Responsibility: Bettina Frohnapfel

Organisation: KIT-Fakultät für Maschinenbau
Curricular Anchorage: Compulsory
Contained in: Fundamentals of Engineering

ECTS	Recurrence	Duration	Language	Version
8	Each summer term	2 terms	German/English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-105207	Fluid Mechanics (S. 54)	8	Bettina Frohnapfel

Learning Control / Examinations
Common examination of "Fluid Mechanics I" and "Fluid Mechanics II"; written exam, 3 hours (graded)

Module Grade
result of exam

Conditions
none

Qualification Objectives
After having completed this module the student is capable of deriving the mathematical equations that describe the motion of fluids and can determine flow quantities for generic problems. He/she can name characteristic properties of fluids and distinguish different flow states. The student is capable of determining fluid quantities in fundamental applications. This includes the calculation of

- static and dynamic forces acting from the fluid onto the solid
- two-dimensional viscous flows
- one-dimensional incompressible and compressible flows without losses
- lossy flows through pipes

Content
properties of fluids, surface tension, hydro- and aerostatics, kinematics, stream tube theory (compressible and incompressible), losses in pipeline systems, dimensional analysis, dimensionless numbers
tensor notation, fluid elements in continuum, Reynolds transport theorem, conservation of mass and momentum, continuity equation, constitutive law for Newtonian fluids, Navier-Stokes equations, angular momentum and energy conservation, integral form of the conservation equations, forces between fluids and solids, analytical solutions of the Navier-Stokes equations

Remarks
For the Bachelor's program Mechanical Engineering the module (including all brick details, exams and courses) is offered in German.
For the Bachelor's program Mechanical Engineering (International) the module (including all brick details, exams and courses) is offered in English.

Literature
Zirep J., Bühler, K.: Grundzüge der Strömungslehre, Grundlagen, Statik und Dynamik der Fluide, Springer Vieweg
Kuhlmann, H.: Strömungsmechanik, Pearson Studium
Spurk, J.H.: Strömungslehre, Einführung in die Theorieder Strömungen, Springer-Verlag
Kundu, P.K., Cohen, K.M.: Fluid Mechanics, Elsevier 2008

Workload
regular attendance: 64 hoursself-study: 176 hours

M Module: Physics [M-PHYS-104030]

Responsibility: Gernot Goll, Bernd Pilawa

Organisation: KIT-Fakultät für Physik

Curricular Anchorage: Compulsory

Contained in: Fundamentals of Engineering

ECTS	Recurrence	Duration	Language	Version
5	Each summer term	1 term	German/English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-PHYS-108322	Wave and Quantum Physics (S. 84)	5	Gernot Goll, Bernd Pilawa

Learning Control / Examinations
The assessment consists of a written exam according to Section 4(2), 1 of the examination regulation.

Conditions
None

Qualification Objectives
The students

- are familiar with the properties of waves and can discuss those
- can reflect on the principles of relativity
- comprehend the coherence of the particle and wave description of light and matter
- can explain the limits of wave physics
- are able the apply the Schrödinger-equation to basic problems in quantum mechanics
- can explain the basic properties of atoms, especially for the hydrogen atom
- can discuss fundamental aspects of the electronic properties of solids

Content

- Properties of waves
- Acoustic and electromagnetic waves
- Interference and diffraction
- Relativity
- Wave-particle dualism
- Basic properties of atoms
- Basic electronic properties of solids

Remarks
For the Bachelor's program Mechanical Engineering the module (including all brick details, exams and courses) is offered in German.
For the Bachelor's program Mechanical Engineering (International) the module (including all brick details, exams and courses) is offered in English.

Workload
150 hours, consisting of attendance times (45), follow-up of the lecture including exam preparation and preparation of exercises (105)

M Module: Electrical Engineering [M-ETIT-104049]

Responsibility: Klaus-Peter Becker

Organisation: KIT-Fakultät für Elektrotechnik und Informationstechnik

Curricular Anchorage: Compulsory

Contained in: Fundamentals of Engineering

ECTS	Recurrence	Duration	Language	Version
8	Each winter term	1 term	German/English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-ETIT-108386	Electrical Engineering and Electronics (S. 47)	8	Klaus-Peter Becker

Learning Control / Examinations
Written exam, duration 3 hours

Conditions
none

Remarks
Exam and Lecture will be held in English.

M Module: Measurement and Control Systems (BSc-Modul 11, MRT) [M-MACH-102564]

Responsibility: Christoph Stiller

Organisation: KIT-Fakultät für Maschinenbau

Curricular Anchorage: Compulsory

Contained in: Fundamentals of Engineering

ECTS	Recurrence	Duration	Language	Version
7	Each winter term	1 term	German/English	2

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-104745	Basics in Measurement and Control Systems (S. 43)	7	Christoph Stiller

Learning Control / Examinations
Type of Examination: written exam
Duration of Examination: 150 minutes

Module Grade
result of exam

Conditions
none

Qualification Objectives

- Students are able to name, describe and explain control principles applied to physical quantities.
- They are able to name, analyze and assess system theoretic characteristics of dynamical systems.
- Students are able to represent real systems in a system theoretic model and to assess the suitability of a given model.
- Students are able to apply methods for controller design and to analyze their properties.
- Students are able to select appropriate principles of metrology and to model, analyze and assess measurement setups.
- Students are able to quantify and assess measurement uncertainties.

Content
1. Dynamic systems
2. Properties of important systems and modeling
3. Transfer characteristics and stability
4. Controller design
5. Fundamentals of measurement
6. Estimation
7. Sensors
8. Introduction to digital measurement

Remarks
For the Bachelor's program Mechanical Engineering the module (including all brick details, exams and courses) is offered in German.
For the Bachelor's program Mechanical Engineering (International) the module (including all brick details, exams and courses) is offered in English.

Workload
84 hours presence time, 126 hours selfstudies

M Module: Computer Science (BSc-Modul 09, Inf) [M-MACH-102563]

Responsibility: Jivka Ovtcharova

Organisation: KIT-Fakultät für Maschinenbau
Curricular Anchorage: Compulsory
Contained in: Fundamentals of Engineering

ECTS	Recurrence	Duration	Language	Version
6	Each summer term	1 term	German/English	2

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-105205	Computer Science for Engineers (S. 45)	6	Jivka Ovtcharova
T-MACH-105206	Computer Science for Engineers (S. 46)	0	Jivka Ovtcharova

Learning Control / Examinations
Written examination "Computer Science for Engineers", 100%, 180 minutes; Examination prerequisite: passed lap course.

Module Grade
Examination result "Computer Science for Engineers" 100%

Conditions
None

Qualification Objectives
Students can identify and explain fundamental terms, problems and concepts of computer science. They can apply the basic methods of the OO modeling with UML and implement the object-oriented programming (OOP) with the programming language JAVA.

Content
Basics: Information representation- and processing, terms and definitions: alphabet, data, signals, information, numeral systems, propositional logic and Boolean algebra, computer architectures, programming paradigms.
Object Orientation: Definition and important characteristics of object orientation, Object-oriented modeling with UML.
Data Structures: Definition, properties and application of graphs, trees, linked lists, queues and stacks.
Algorithms: Characteristics of algorithms, complexity analysis, design methods, important examples.
Database management systems: Relational data model, relational algebra, declarative language SQL. Basics and concepts of JAVA. Introduction to programming using JAVA.

Remarks
For the Bachelor's program Mechanical Engineering the module (including all brick details, exams and courses) is offered in German.
For the Bachelor's program Mechanical Engineering (International) the module (including all brick details, exams and courses) is offered in English.

Workload
Attendance time: 63 hours
Self-study: 117 hours

M Module: Mechanical Design (BSc-Modul 06, MKL) [M-MACH-102573]

Responsibility: Albert Albers

Organisation: KIT-Fakultät für Maschinenbau
Curricular Anchorage: Compulsory
Contained in: Fundamentals of Engineering

ECTS	Recurrence	Duration	Language	Version
20	Each winter term	4 terms	German/English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-105286	Mechanical Design I & II (S. 65)	7	Albert Albers, Norbert Burkardt, Sven Matthiesen
T-MACH-104810	Mechanical Design III & IV (S. 68)	13	Albert Albers, Norbert Burkardt, Sven Matthiesen
T-MACH-105282	Mechanical Design I, prerequisites (S. 66)	0	Albert Albers, Sven Matthiesen
T-MACH-105283	Mechanical Design II, prerequisites (S. 67)	0	Albert Albers, Sven Matthiesen
T-MACH-105284	Mechanical Design III, Constructing the Team (S. 69)	0	Albert Albers, Sven Matthiesen
T-MACH-105285	Mechanical Design IV, Constructing the Team (S. 70)	0	Albert Albers, Sven Matthiesen

Learning Control / Examinations
Mechanical Design I & II:
Preliminary examination: Successful participation in workshops in the field of mechanical design I and II
Written Examination concerning the teaching program of mechanical design I and II: duration 60 min
Mechanical Design III & IV:
Preliminary examination: Successful participation in workshops in the field of mechanical design IIII and IV
Examination concerning the teaching programm of mechanical design III and IV with

- written part duration 60 min and
- design part duration 180 min.

Conditions
none

Qualification Objectives
The students are able to ...

- analyze the function of unknown machine elements.
- use the interpretation and dimensioning guidelines according the common standardization regulations.
- identify technical problems and to work out and evaluate systematic solutions.
- illustrate problem solving's in technical drawings and cad models according the common standardization regulations.
- estimate the volume and time need of the given tasks and to split them between the team members.
- synthesize the design steps of product engineering by means of a complex technical system.

Content
The Mechanical Design Module provides an introduction to product development and teaches the basics of selected design and machine elements. The focus is on the basics of clutches, gears and gearing. At the same time, skills and tools for visualization (technical drawing) are imparted.

Workload
lectures and exercises: 174h
homework and preparation of examination: 426h

M Module: Machines and Processes (mach13BSc-Modul 13, MuP) [M-MACH-102566]

Responsibility: Heiko Kubach

Organisation: KIT-Fakultät für Maschinenbau

Curricular Anchorage: Compulsory

Contained in: Fundamentals of Engineering

ECTS	Recurrence	Duration	Language	Version
7	Each winter term	1 term	German/English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-105208	Machines and Processes (S. 61)	7	Hans-Jörg Bauer, Heiko Kubach, Ulrich Maas, Balazs Pritz
T-MACH-105232	Machines and Processes, Prerequisite (S. 62)	0	Hans-Jörg Bauer, Heiko Kubach, Ulrich Maas, Balazs Pritz

Learning Control / Examinations
written exam (3 h) and successful lab course

Module Grade
Grade out of written exam (100%)

Conditions
Successful lab course is a precondition to take part at the exam.

Qualification Objectives
The students can name and describe basic energy conversion processes and energy converting machines. They can explain the application of these energy conversion processes in various machines. They can analyze and evaluate the processes and machines in terms of functionality and efficiency and they are able to solve basic technical problems in terms of operating the machines.

M Module: Production Operations Management [M-MACH-100297]

Responsibility: Kai Furmans

Organisation: KIT-Fakultät für Maschinenbau

Curricular Anchorage: Compulsory

Contained in: Fundamentals of Engineering

ECTS	Recurrence	Duration	Language	Version
5	Each winter term	1 term	German/English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-100304	Production Operations Management (S. 72)	5	Kai Furmans, Gisela Lanza, Frank Schultmann

Learning Control / Examinations
written examn, 90 min, graded

Qualification Objectives
Students are able to:

- describe the connections between production sience, work scheduling and -design, material flow and basics of economics,
- differentiate between production systems and knows there characteristics,
- design workplaces according to the requirements,
- create a material flow system to ensure supply a production system according to the system parameters and
- Evaluate necessary systems finacially.

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M Module: MF A: Global Production Management [M-MACH-103351]

Responsibility: Gisela Lanza

Organisation: KIT-Fakultät für Maschinenbau
Curricular Anchorage: Compulsory Elective
Contained in: Majors in Mechanical Engineering (International)

ECTS	Recurrence	Duration	Language	Version
16	Each term	2 terms	English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-106731	Global Production Engineering (MEI) (S. 58)	4	Gisela Lanza
T-MACH-105379	Global Logistics (S. 57)	4	Kai Furmans

SP A: Globales Produktionsmanagement
Non-Compulsory Block; You must choose at least 8 credits.

Identifier	Course	ECTS	Responsibility
T-MACH-106733	SmartFactory@Industry (MEI) (S. 74)	4	Gisela Lanza
T-MACH-105381	Virtual Engineering (Specific Topics) (S. 83)	4	Jivka Ovtcharova
T-MACH-106732	Automated Production Systems (MEI) (S. 39)	4	Jürgen Fleischer

Learning Control / Examinations
Oral exams: duration approx. 5 min per credit point
Amount, type and scope of the success control can vary according to the individually choice.

Conditions
None

Qualification Objectives
The students acquire in the compulsory core subjects profound knowledge about the scientific theories, principles and methods of Production Engineering. Afterwards they are able to evaluate and design complex production systems according to problems of manufacturing and process technologies, materials handling, handling techniques, information engineering as well as production organisation and management.
After completion this module, the students are able

- to analyse and solve planning and layout problems on the level of the enterprise, production, processes and work tasks,
- to plan and control a production,
- to evaluate and configure the quality and efficiency of production, processes and products.

Content
The aim of "SP A: Global Production Management" is to present the challenges of globally operating companies and to give an overview of the central aspects of global production networks as well as to gain in-depth knowledge of common methods and procedures for designing them. For this purpose, methods for site selection, approaches for the site-specific adaptation of production technologies as well as planning approaches for setting up a new production location will be imparted during the module. The module will be rounded off by presenting Industry 4.0 methods and technologies.
The topics in detail are:

- Framework conditions and influencing factors of global production (historical development, goals, opportunities and risks)
- Site selection
- Site-specific production adaptation
- Planning a new production site
- Design and management of global production networks
- Integration of Industry 4.0 methods and technologies

Recommendations
none

Workload
The work load is about 480 hours, corresponding to 16 credit points.

M Module: MF B: Energy Engineering [M-MACH-103350]

Responsibility: Hans-Jörg Bauer

Organisation: KIT-Fakultät für Maschinenbau
Curricular Anchorage: Compulsory Elective
Contained in: Majors in Mechanical Engineering (International)

ECTS	Recurrence	Duration	Language	Version
16	Each term	2 terms	English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-105220	Fundamentals of Energy Technology (S. 56)	8	Aurelian Florin Badea, Xu Cheng

SP B: Energietechnik
Non-Compulsory Block; You must choose at least 8 credits.

Identifier	Course	ECTS	Responsibility
T-MACH-105213	Fundamentals of Combustion I (S. 55)	4	Ulrich Maas, Jörg Sommerer
T-MACH-105292	Heat and Mass Transfer (S. 59)	4	Henning Bockhorn, Ulrich Maas

Learning Control / Examinations
Oral exams: duration approx. 5 min. per credit point.
However, amount, type and scope of the success control can vary according to the individually choice.

Conditions
None

Qualification Objectives
After completion of SP B students are able

- to describe the elements of an energy system and their interactions,
- to list different conventional energy sources and assess their static range,
- to name the fluctuating supply of renewable energies such as wind, solar radiation, ocean currents and tides etc. and
- describe its effects on the energy system,
- to assess the technical boundary conditions of energy systems
- to derive approaches for an optimal mix of different energy technologies,
- to explain the operational principle of well-established power plants as well as of power plants based on renewables,
- to name the physical and chemical processes during energy conversion

Content
The aim of SP B "Energy Engineering" is to bring the students closer to the challenges of modern energy systems. The functional principles of conventional and regenerative power plant types are presented and the underlying physical principles of technical combustion and heat and mass transfer are explained. The students learn the basics to evaluate energy systems on a technical and economic basis.

Topics include:

- forms of energy

- energy sources: fossil fuels, nuclear energy, renewable energies
- energy demand structures
- principles of thermal and electrical power plants (conventional and renewable)
- physical basics of technical combustion
- stationary and transient heat and mass transfer phenomena
- environmental aspects of energy production
- role of renewable energies
- conversion, transport and storage of energy
- economic feasibility study of energy systems
- future of the energy sector

Workload
The work load is about 480 hours, corresponding to 16 credit points.

M Module: MF C: Automotive Engineering [M-MACH-103349]

Responsibility: Frank Gauterin

Organisation: KIT-Fakultät für Maschinenbau
Curricular Anchorage: Compulsory Elective
Contained in: Majors in Mechanical Engineering (International)

ECTS	Recurrence	Duration	Language	Version
16	Each term	2 terms	English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-100092	Automotive Engineering I (S. 40)	8	Frank Gauterin, Hans-Joachim Unrau

SP C: Kraftfahrzeugtechnik
Non-Compulsory Block; You must choose at least 8 credits.

Identifier	Course	ECTS	Responsibility
T-MACH-102117	Automotive Engineering II (S. 41)	4	Frank Gauterin, Hans-Joachim Unrau
T-MACH-105154	Vehicle Comfort and Acoustics I (S. 81)	4	Frank Gauterin
T-MACH-105155	Vehicle Comfort and Acoustics II (S. 82)	4	Frank Gauterin
T-MACH-105210	Machine Dynamics (S. 60)	5	Carsten Proppe
T-ETIT-100807	Electrical Machines (S. 48)	4	Klaus-Peter Becker

Learning Control / Examinations
Oral exams: duration approx. 5 min. per credit point.
However, amount, type and scope of the success control can vary according to the individually choice.

Conditions
none

Qualification Objectives
The students know the movements and the forces at the vehicle and are familiar with active and passive safety. They have proper knowledge about operation of engines and alternative drives, the necessary transmission between engine and drive wheels and the power distribution. They have an overview of the components necessary for the drive and have the basic knowledge, to analyse, to evaluate, and to develop the complex system "vehicle".
Further learning objectives according to the selected courses of supplementary subjects.

Content
1. History and future of the automobile

2. Driving mechanics: driving resistances and driving performance, mechanics of longitudinal and lateral forces, active and passive safety

3. Drive systems: combustion engine, hybrid and electric drive systems

4. Transmissions: clutches (e.g. friction clutch, visco clutch), transmission (e.g. mechanical transmission, hydraulic fluid

transmission)

5.Power transmission and distribution: drive shafts, cardon joints, differentials

Workload
The work load is about 480 hours, corresponding to 16 credit points.

5 International Project Management and Soft Skills

M Module: International Project Management and Soft Skills [M-MACH-103322]

Responsibility: Barbara Deml, Stefan Nickel

Organisation: KIT-Fakultät für Maschinenbau

Curricular Anchorage: Compulsory

Contained in: International Project Management and Soft Skills

ECTS	Recurrence	Duration	Language	Version
6	Each term	2 terms	English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MACH-105296	Working Methods in Mechanical Engineering (S. 85)	4	Barbara Deml
T-WIWI-108295	Project and Operations Management (S. 73)	2	Stefan Nickel

Learning Control / Examinations
Success is monitored within the framework of academic achievements.

Conditions
None

Qualification Objectives

- The student gains knowledge of the principles and various instruments of project management and project planning and the acquisition of abilities to plan projects and create controlling systems.
- The student performs an analysis of various methods and procedures of multi-project management and project controlling in a global context.
- The student acquires knowledge of the product development process as well as important parameters of product development and development methods in the context of project management.

Content
Working Methods in Mechanical Engineering:
1. Time and self management
2. Teamwork
3. Literature research
4. Scientific Writing
5. Scientific Presentation

Project and Operations Management:
Students will learn how to structure planning problems occurring in a company's operations or in international projects. Moreover, they are introduced to fundamental quantitative planning techniques and tools for solving real-world project and operations management problems.
Topics of the lecture include:

- Introduction to optimization
- Network planning techniques (CPM, PERT, stochastic time analysis etc.)
- Inventory management (single- and multi-period models etc.)
- Operations scheduling (single and parallel machine scheduling etc.)

Literature
The script and references are available for download on ILIAS.

Workload
The total workload for this module is approximately 180 hours. The total workload per course is obtained from the workload contributing to lecture and exercise attendance, exam hours, and the required time which it takes for an average student with average capacities to achieve the specified learning targets of this module.

Part II
Courses

T Course: Advanced Mathematics I [T-MATH-108266]

Responsibility: Maria Aksenovich, Stefan Kühnlein
Contained in: [M-MACH-104162] Orientation Exam
[M-MATH-104022] Advanced Mathematics

ECTS	Recurrence	Exam type	Version
7	Jedes Semester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
Assessment is carried out in form of a written examinations of 120 minutes length.

Conditions
Passing scores for homework and the midterm test are prerequesites for the examination.

Modeled Conditions
The following conditions must be met:

- The course [T-MATH-108265] *Advanced Mathematics I Prerequisite* must have been passed.

T Course: Advanced Mathematics I Prerequisite [T-MATH-108265]

Responsibility: Maria Aksenovich, Stefan Kühnlein
Contained in: [M-MATH-104022] Advanced Mathematics

ECTS	Recurrence	Exam type	Version
0	Jedes Wintersemester	Studienleistung schriftlich	1

Learning Control / Examinations
Assessment is carried out based on written homework assignments and a midterm test. Exact requirements will be detailed in class.

Conditions
None.

T Course: Advanced Mathematics II [T-MATH-108268]

Responsibility: Maria Aksenovich, Stefan Kühnlein
Contained in: [M-MATH-104022] Advanced Mathematics

ECTS	Recurrence	Exam type	Version
7	Jedes Semester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
Assessment is carried out in form of a written examinations of 120 minutes length.

Conditions
Passing scores for homework and the midterm test are prerequesites for the examination.

Modeled Conditions
The following conditions must be met:

- The course [T-MATH-108267] *Advanced Mathematics II Prerequisite* must have been passed.

T Course: Advanced Mathematics II Prerequisite [T-MATH-108267]

Responsibility: Maria Aksenovich, Stefan Kühnlein
Contained in: [M-MATH-104022] Advanced Mathematics

ECTS	Recurrence	Exam type	Version
0	Jedes Sommersemester	Studienleistung schriftlich	1

Learning Control / Examinations
Assessment is carried out based on written homework assignments and a midterm test. Exact requirements will be detailed in class.

Conditions
None.

T Course: Advanced Mathematics III [T-MATH-108270]

Responsibility: Maria Aksenovich, Stefan Kühnlein
Contained in: [M-MATH-104022] Advanced Mathematics

ECTS	Recurrence	Exam type	Version
7	Jedes Semester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
Assessment is carried out in form of a written examinations of 120 minutes length.

Conditions
Passing scores for homework and the midterm test are prerequesites for the examination.

Modeled Conditions
The following conditions must be met:

- The course [T-MATH-108269] *Advanced Mathematics III Prerequisite* must have been passed.

T Course: Advanced Mathematics III Prerequisite [T-MATH-108269]

Responsibility: Maria Aksenovich, Stefan Kühnlein
Contained in: [M-MATH-104022] Advanced Mathematics

ECTS	Recurrence	Exam type	Version
0	Jedes Wintersemester	Studienleistung schriftlich	1

Learning Control / Examinations
Assessment is carried out based on written homework assignments and a midterm test. Exact requirements will be detailed in class.

Conditions
None.

T Course: Automated Production Systems (MEI) [T-MACH-106732]

Responsibility: Jürgen Fleischer
Contained in: [M-MACH-103351] MF A: Global Production Management

ECTS	Recurrence	Exam type	Version
4	Jedes Sommersemester	Prüfungsleistung mündlich	1

Learning Control / Examinations
oral exam (20 min)

Conditions
none

T Course: Automotive Engineering I [T-MACH-100092]

Responsibility: Frank Gauterin, Hans-Joachim Unrau
Contained in: [M-MACH-103349] MF C: Automotive Engineering

ECTS	Language	Recurrence	Exam type	Version
8	Deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 17/18	2113805	Automotive Engineering I	Vorlesung (V)	4	Frank Gauterin, Hans-Joachim Unrau

Learning Control / Examinations
Written examination

Duration: 120 minutes

Auxiliary means: none

Conditions
The brick "T-MACH-102203 - Automotive Engineering I" is not started or finished. The bricks "T-MACH-100092 - Grundlagen der Fahrzeugtechnik I" and "T-MACH-102203 - Automotive Engineering I" can not be combined.

T Course: Automotive Engineering II [T-MACH-102117]

Responsibility: Frank Gauterin, Hans-Joachim Unrau
Contained in: [M-MACH-103349] MF C: Automotive Engineering

ECTS	Language	Recurrence	Exam type	Version
4	Deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2114835	Automotive Engineering II	Vorlesung (V)	2	Hans-Joachim Unrau

Learning Control / Examinations
Written Examination

Duration: 90 minutes

Auxiliary means: none

Conditions
none

T Course: Bachelor Thesis [T-MACH-108685]

Responsibility: Martin Heilmaier
Contained in: [M-MACH-103722] Bachelor Thesis

ECTS	Recurrence	Version
12	Jedes Semester	1

Learning Control / Examinations
The bachelor thesis is designed to show that the student is able to deal with a problem of his/her subject area in an independent manner and within the given period of time using scientific methods.
The work load of the bachelor thesis corresponds to 12 ECTS. The maximal processing time of the bachelor thesis takes three months. The date of issue of the subject has to be fixed by the supervisor and the student and to be put on record at the examination board. The subject of the bachelor thesis may be only returned once and only within the first month of processing time.
On a reasoned request of the student, the examination board can extend the processing time by up to one month. If the bachelor thesis is not completed in time, this examination is "failed" (5,0), unless the student is not responsible.
The bachelor thesis is to be evaluated by not less than a professor or a senior scientist according to § 14 Abs. 3 Ziff. 1 KITG and another examiner. Generally, one of the two examiners is the person who has assigned the thesis. If the examiners do not agree, the bachelor thesis is graded by the examination board within this assessment; another expert can be appointed too. The bachelor thesis has to be graded within a period of six weeks after the submission.

Conditions
The requirement for admission to the bachelor thesis module are 120 ECTS. As to exceptions, the examination board decides on a request of the student (see § 14 (1) SPO).

Remarks
The workload for the preparation of the bachelor thesis is about 360 hours.

T Course: Basics in Measurement and Control Systems [T-MACH-104745]

Responsibility: Christoph Stiller
Contained in: [M-MACH-102564] Measurement and Control Systems

ECTS	Language	Recurrence	Exam type	Version
7	Deutsch/Englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 17/18	2137301	Measurement and Control Systems	Vorlesung (V)	3	Christoph Stiller
WS 17/18	2137302		Übung (Ü)	1	Christoph Burger, Johannes Janosovits, Maximilian Naumann, Christoph Stiller
WS 17/18	3137020	Measurement and Control Systems	Vorlesung (V)	3	Christoph Stiller
WS 17/18	3137021	Measurement and Control Systems (Tutorial)	Übung (Ü)	1	Christoph Burger, Johannes Janosovits, Christoph Stiller

Learning Control / Examinations
written exam
2,5 hours

Conditions
none

T Course: Basics of Manufacturing Technology (MEI) [T-MACH-108747]

Responsibility: Volker Schulze, Frederik Zanger
Contained in: [M-MACH-104232] Manufacturing Processes (MEI)

ECTS	Recurrence	Version
4	Jedes Wintersemester	1

Learning Control / Examinations
written exam (duration: 60 min)

Conditions
none

T Course: Computer Science for Engineers [T-MACH-105205]

Responsibility: Jivka Ovtcharova
Contained in: [M-MACH-102563] Computer Science

ECTS	Language	Recurrence	Exam type	Version
6	Deutsch/englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2121390	Computer Science for Engineers	Vorlesung / Übung (VÜ)	4	Jivka Ovtcharova
SS 2017	2121391	Exercises Computer Science for Engineers	Übung (Ü)	2	Mitarbeiter, Jivka Ovtcharova
WS 17/18	3121035		Übung (Ü)	2	Mitarbeiter, Jivka Ovtcharova

Learning Control / Examinations
Written exam [180 min]

Conditions
Computer Science for Engineers, passed

Modeled Conditions
The following conditions must be met:

- The course [T-MACH-105206] *Computer Science for Engineers* must have been passed.

T Course: Computer Science for Engineers [T-MACH-105206]

Responsibility: Jivka Ovtcharova
Contained in: [M-MACH-102563] Computer Science

ECTS	Language	Recurrence	Exam type	Version
0	Deutsch	Jedes Sommersemester	Studienleistung praktisch	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2121392	Computer Lab for Computer Science in Mechanical Engineering	Praktische Übung (PÜ)	2	Mitarbeiter, Jivka Ovtcharova
WS 17/18	2121392	Computer Lab for Computer Science in Mechanical Engineering	Praktische Übung (PÜ)	2	Mitarbeiter, Jivka Ovtcharova
WS 17/18	3121036		Praktische Übung (PÜ)	2	Mitarbeiter, Jivka Ovtcharova

Learning Control / Examinations
Programming assignments, that are to be implemented at the computer, are given every two weeks. The students are supervised by tutors while they work on the assignments. Therefore online tests must be solved by the students to assess the understanding of the tasks and the lecture material. All assignments have to be handed in, before they can take part in the exam.

Conditions
none

T Course: Electrical Engineering and Electronics [T-ETIT-108386]

Responsibility: Klaus-Peter Becker
Contained in: [M-ETIT-104049] Electrical Engineering

ECTS	Recurrence	Exam type	Version
8	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
Written exam, duration 3 hours.

Conditions
none

T Course: Electrical Machines [T-ETIT-100807]

Responsibility: Klaus-Peter Becker
Contained in: [M-MACH-103349] MF C: Automotive Engineering

ECTS	Exam type	Version
4	Prüfungsleistung mündlich	1

T Course: Engineering Mechanics I [T-MACH-100282]

Responsibility: Thomas Böhlke, Tom-Alexander Langhoff
Contained in: [M-MACH-104162] Orientation Exam
[M-MACH-102572] Engineering Mechanics

ECTS	Language	Recurrence	Exam type	Version
7	Deutsch/Englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 17/18	2161245	Engineering Mechanics I	Vorlesung (V)	3	Thomas Böhlke
WS 17/18	3161010		Vorlesung (V)	3	Thomas Böhlke, Tom-Alexander Langhoff

Learning Control / Examinations
written exam, 90 min, graded

Conditions
successful participation in "Engineering Mechanics I (Tutorial)" (see T-MACH-100528)

Modeled Conditions
The following conditions must be met:

- The course [T-MACH-100528] *Tutorial Engineering Mechanics I* must have been passed.

T Course: Engineering Mechanics II [T-MACH-100283]

Responsibility: Thomas Böhlke, Tom-Alexander Langhoff
Contained in: [M-MACH-104162] Orientation Exam
[M-MACH-102572] Engineering Mechanics

ECTS	Language	Recurrence	Exam type	Version
6	Deutsch/Englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2162250	Engineering Mechanics II	Vorlesung (V)	3	Thomas Böhlke
SS 2017	3162010		Vorlesung (V)	2	Thomas Böhlke, Tom-Alexander Langhoff

Learning Control / Examinations
written exam, 90 min, graded

Conditions
successful participation in "Engineering Mechanics II (Tutorial)" (see T-MACH-100284)

Modeled Conditions
The following conditions must be met:

- The course [T-MACH-100284] *Tutorial Engineering Mechanics II* must have been passed.

T Course: Engineering Mechanics III & IV [T-MACH-105201]

Responsibility: Wolfgang Seemann
Contained in: [M-MACH-102572] Engineering Mechanics

ECTS	Language	Recurrence	Exam type	Version
10	Deutsch/englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2162231	Engineering Mechanics IV	Vorlesung (V)	2	Wolfgang Seemann
SS 2017	3162012		Vorlesung (V)	2	Wolfgang Seemann
WS 17/18	2161203	Engineering Mechanics III	Vorlesung (V)	2	Wolfgang Seemann
WS 17/18	3161012		Vorlesung (V)	2	Wolfgang Seemann

Modeled Conditions
The following conditions must be met:

1. The course [T-MACH-105202] *Tutorial Engineering Mechanics III* must have been passed.
2. The course [T-MACH-105203] *Tutorial Engineering Mechanics IV* must have been passed.

T Course: Excercises in Technical Thermodynamics and Heat Transfer I [T-MACH-105204]

Responsibility: Ulrich Maas
Contained in: [M-MACH-102574] Technical Thermodynamics

ECTS	Language	Recurrence	Exam type	Version
0	Deutsch/Englisch	Jedes Wintersemester	Studienleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 17/18	2165502	Exercise course Technical Thermodynamics and Heat Transfer I	Übung (Ü)	2	Ulrich Maas
WS 17/18	3165015	Technical Thermodynamics and Heat Transfer I (Tutorial)	Übung (Ü)	2	Ulrich Maas, Robert Schießl

Learning Control / Examinations
Homework is mandatory.

T Course: Excercises in Technical Thermodynamics and Heat Transfer II [T-MACH-105288]

Responsibility: Ulrich Maas
Contained in: [M-MACH-102574] Technical Thermodynamics

ECTS	Language	Recurrence	Exam type	Version
0	Deutsch	Jedes Sommersemester	Studienleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2166556	Technical Thermodynamics and Heat Transfer II (Tutorial)	Übung (Ü)	2	Ulrich Maas
SS 2017	3166033	Technical Thermodynamics and Heat Transfer II (Tutorial)	Übung (Ü)	2	Ulrich Maas, Robert Schießl

Learning Control / Examinations
Homework is mandatory.

Conditions
none

T Course: Fluid Mechanics [T-MACH-105207]

Responsibility: Bettina Frohnapfel
Contained in: [M-MACH-102565] Fluid Mechanics

ECTS	Language	Recurrence	Exam type	Version
8	Deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2154512	Fluid Mechanics I	Vorlesung / Übung (VÜ)	3	Bettina Frohnapfel
WS 17/18	2153512	Fluid Mechanics II	Vorlesung / Übung (VÜ)	3	Bettina Frohnapfel
WS 17/18	3153511	Strömungstechnik II	Vorlesung (V)		Bettina Frohnapfel

Learning Control / Examinations
written exam

Conditions
none

T Course: Fundamentals of Combustion I [T-MACH-105213]

Responsibility: Ulrich Maas, Jörg Sommerer
Contained in: [M-MACH-103350] MF B: Energy Engineering

ECTS	Language	Recurrence	Exam type	Version
4	Deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 17/18	2165515	Fundamentals of Combustion I	Vorlesung (V)	2	Ulrich Maas
WS 17/18	2165517	Fundamentals of Combustion I (Tutorial)	Übung (Ü)	1	Ulrich Maas

Learning Control / Examinations
Written exam, 3 h

Conditions
none

T Course: Fundamentals of Energy Technology [T-MACH-105220]

Responsibility: Aurelian Florin Badea, Xu Cheng
Contained in: [M-MACH-103350] MF B: Energy Engineering

ECTS	Language	Recurrence	Exam type	Version
8	Deutsch/Englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2130927	Fundamentals of Energy Technology	Vorlesung (V)	3	Aurelian Florin Badea, Xu Cheng
SS 2017	3190923	Fundamentals of Energy Technology	Vorlesung (V)	3	Aurelian Florin Badea

Learning Control / Examinations
Written examination, 90 min

Conditions
none

T Course: Global Logistics [T-MACH-105379]

Responsibility: Kai Furmans
Contained in: [M-MACH-103351] MF A: Global Production Management

ECTS	Recurrence	Exam type	Version
4	Jedes Sommersemester	Prüfungsleistung mündlich	1

Learning Control / Examinations
oral exam (20 min)

Conditions
none

T Course: Global Production Engineering (MEI) [T-MACH-106731]

Responsibility: Gisela Lanza
Contained in: [M-MACH-103351] MF A: Global Production Management

ECTS	Language	Recurrence	Exam type	Version
4	Englisch	Jedes Sommersemester	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	3150040	Global Production Engineering (MEI)	Vorlesung (V)	2	Gisela Lanza, Nicole Stricker

Learning Control / Examinations
oral exam (45 min group examination with 3 students)

Conditions
none

T Course: Heat and Mass Transfer [T-MACH-105292]

Responsibility: Henning Bockhorn, Ulrich Maas
Contained in: [M-MACH-103350] MF B: Energy Engineering

ECTS	Language	Recurrence	Exam type	Version
4	Deutsch	Jedes Semester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	3122512		Vorlesung (V)	2	Henning Bockhorn
WS 17/18	2165512	Heat and mass transfer	Vorlesung (V)	2	Ulrich Maas

Learning Control / Examinations
Written exam, 3 h

Conditions
none

T Course: Machine Dynamics [T-MACH-105210]

Responsibility: Carsten Proppe
Contained in: [M-MACH-103349] MF C: Automotive Engineering

ECTS	Language	Recurrence	Exam type	Version
5	Englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2161224	Machine Dynamics	Vorlesung (V)	2	Carsten Proppe
SS 2017	2161225		Übung (Ü)	1	Maxime Koebele, Carsten Proppe

Learning Control / Examinations
written exam, 180 min.

Conditions
none

T Course: Machines and Processes [T-MACH-105208]

Responsibility: Hans-Jörg Bauer, Heiko Kubach, Ulrich Maas, Balazs Pritz
Contained in: [M-MACH-102566] Machines and Processes

ECTS	Recurrence	Exam type	Version
7	Jedes Semester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 17/18	2185000	Machines and Processes	Vorlesung / Übung (VÜ)	4	Hans-Jörg Bauer, Martin Gabi, Heiko Kubach, Ulrich Maas

Learning Control / Examinations
written exam (duration: 120 min)

Conditions
Taking part at the exam is possible only when lab course has been successfully completed

Modeled Conditions
The following conditions must be met:

- The course [T-MACH-105232] *Machines and Processes, Prerequisite* must have been passed.

T Course: Machines and Processes, Prerequisite [T-MACH-105232]

Responsibility: Hans-Jörg Bauer, Heiko Kubach, Ulrich Maas, Balazs Pritz
Contained in: [M-MACH-102566] Machines and Processes

ECTS	Recurrence	Exam type	Version
0	Jedes Semester	Studienleistung	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2187000	Machinery and Processes	Praktikum (P)	1	Hans-Jörg Bauer, Martin Gabi, Heiko Kubach, Ulrich Maas
WS 17/18	2187000	Machinery and Processes	Praktikum (P)	1	Hans-Jörg Bauer, Martin Gabi, Heiko Kubach, Ulrich Maas

Learning Control / Examinations
successful completed training course

Conditions
none

T Course: Materials Science I & II [T-MACH-105145]

Responsibility: Jens Gibmeier, Martin Heilmaier, Kay Weidenmann
Contained in: [M-MACH-102562] Materials Science

ECTS	Language	Recurrence	Exam type	Version
11	Deutsch/Englisch	Jedes Wintersemester	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2174560	Materials Science and Engineering II for mach, phys	Vorlesung (V)	3	Martin Heilmaier, Hans Jürgen Seifert, Sven Ulrich
SS 2017	3174015		Vorlesung (V)	3	Jens Gibmeier
SS 2017	3174026		Übung (Ü)	1	Jens Gibmeier, Mitarbeiter
WS 17/18	2173550	Materials Science and Engineering I for mach, phys	Vorlesung (V)	4	Hans Jürgen Seifert, Sven Ulrich
WS 17/18	3173008		Vorlesung (V)	4	Jens Gibmeier
WS 17/18	3173009		Übung (Ü)	1	Jens Gibmeier

Learning Control / Examinations
oral exam

Modeled Conditions
The following conditions must be met:

- The course [T-MACH-105146] *Materials Science Lab Course* must have been passed.

T Course: Materials Science Lab Course [T-MACH-105146]

Responsibility: Martin Heilmaier, Anton Möslang, Kay Weidenmann
Contained in: [M-MACH-102562] Materials Science

ECTS	Language	Recurrence	Exam type	Version
3	Deutsch/Englisch	Jedes Sommersemester	Studienleistung praktisch	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2174587	Experimental Lab Course in Material Science, part B of class	Praktikum (P)	3	Stefan Dietrich, Jens Gibmeier, Martin Heilmaier, Karl-Heinz Lang, Kay Weidenmann
SS 2017	2174597	Experimental Lab Course in Material Science, part A of class	Praktikum (P)	3	Stefan Dietrich, Jens Gibmeier, Martin Heilmaier, Karl-Heinz Lang, Kay Weidenmann
SS 2017	3174016		Praktikum (P)	3	Stefan Dietrich, Jens Gibmeier, Martin Heilmaier, Karl-Heinz Lang, Kay Weidenmann

Learning Control / Examinations
Oral colloquium at the beginning of each topic; certificate of successful attendance.

Conditions
none

Remarks
The workload for the lab course Materials Science is 90 h in total and consists of the presence during the 10 experiments (one week half-time, 4 hours per day) as well as preparation and rework time at home.

T Course: Mechanical Design I & II [T-MACH-105286]

Responsibility: Albert Albers, Norbert Burkardt, Sven Matthiesen
Contained in: [M-MACH-102573] Mechanical Design

ECTS	Language	Recurrence	Exam type	Version
7	Deutsch/Englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2146178	Mechanical Design II	Vorlesung (V)	2	Sven Matthiesen
SS 2017	3146017		Vorlesung (V)	2	Albert Albers, Norbert Burkardt
WS 17/18	2145178	Mechanical Design I	Vorlesung (V)	2	Albert Albers, Matthias Behrendt
WS 17/18	2145186		Vorlesung (V)	2	Albert Albers, Norbert Burkardt

Learning Control / Examinations
written exam, graded, duration: 60 min

Conditions
Admission to the exam only with successful completion of the T-MACH-105282 - Mechanical Design I, prerequisites and T-MACH-105283 - Mechanical Design II, prerequisites.

Modeled Conditions
The following conditions must be met:

1. The course [T-MACH-105282] *Mechanical Design I, prerequisites* must have been passed.
2. The course [T-MACH-105283] *Mechanical Design II, prerequisites* must have been passed.

T Course: Mechanical Design I, prerequisites [T-MACH-105282]

Responsibility: Albert Albers, Sven Matthiesen
Contained in: [M-MACH-102573] Mechanical Design

ECTS	Language	Recurrence	Exam type	Version
0	Deutsch/Englisch	Jedes Wintersemester	Studienleistung	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 17/18	2145185	Tutorials Mechanical Design I	Übung (Ü)	1	Albert Albers, Mitarbeiter
WS 17/18	2145187		Übung (Ü)	2	Albert Albers, Norbert Burkardt

Learning Control / Examinations
Concomitant to the lecture, a workshop with 3 workshop sessions takes place over the semester. During the workshop the students are divided into groups and their mechanical design knowledge will be tested during a colloquium at the beginning of every single workshop session. The attendance is mandatory and will be controlled. The pass of the colloquia and the process of the workshop task are required for the successful participation.
Furthermore an online test is carried out.

Conditions
none

T Course: Mechanical Design II, prerequisites [T-MACH-105283]

Responsibility: Albert Albers, Sven Matthiesen
Contained in: [M-MACH-102573] Mechanical Design

ECTS	Language	Recurrence	Exam type	Version
0	Deutsch/Englisch	Jedes Sommersemester	Studienleistung	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2146185	Tutorials Mechanical Design II	Übung (Ü)	2	Sven Matthiesen, Mitarbeiter
SS 2017	3146018		Übung (Ü)	2	Albert Albers, Mitarbeiter

Learning Control / Examinations
Concomitant to the lecture, 2 online tests are carried out and the knowledge from the lecture will be tested. The knowledge from mechanical design I and II will further be controlled with a design and a CAD task.

Conditions
None

T Course: Mechanical Design III & IV [T-MACH-104810]

Responsibility: Albert Albers, Norbert Burkardt, Sven Matthiesen
Contained in: [M-MACH-102573] Mechanical Design

ECTS	Language	Recurrence	Exam type	Version
13	Deutsch/Englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2146177	Mechanical Design IV	Vorlesung (V)	2	Albert Albers, Norbert Burkardt
SS 2017	3146020		Vorlesung (V)	2	Albert Albers, Norbert Burkardt
WS 17/18	2145151	Mechanical Design III	Vorlesung (V)	2	Sven Matthiesen, Mitarbeiter
WS 17/18	3145016		Vorlesung (V)	2	Albert Albers, Norbert Burkardt

Learning Control / Examinations
written exam consisting of:

- written part duration 60 min and
- design part duration 180 min

Sum: 240 min

Conditions
Admission to the exam only with successful completion of the T-MACH-105284 - Mechanical Design III, Constructing the Team and T-MACH-105285 - Mechanical Design IV, Constructing the Team.

Modeled Conditions
1 of 2 conditions must be met:

1. The course [T-MACH-105284] *Mechanical Design III, Constructing the Team* must have been passed.
2. The course [T-MACH-105285] *Mechanical Design IV, Constructing the Team* must have been passed.

T Course: Mechanical Design III, Constructing the Team [T-MACH-105284]

Responsibility: Albert Albers, Sven Matthiesen
Contained in: [M-MACH-102573] Mechanical Design

ECTS	Language	Recurrence	Exam type	Version
0	Deutsch/Englisch	Jedes Wintersemester	Studienleistung	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 17/18	2145153	Tutorials Mechanical Design III	Übung (Ü)	2	Sven Matthiesen, Mitarbeiter
WS 17/18	3145017		Übung (Ü)	2	Albert Albers, Norbert Burkardt
WS 17/18	3145018		Seminar / Praktikum (S/P)		Albert Albers, Norbert Burkardt

Learning Control / Examinations
Concomitant to the lecture, a workshop with 3 workshop sessions takes place over the semester. During the workshop the students are divided into groups and their mechanical design knowledge will be tested during a colloquium at the beginning of every single workshop session. The attendance is mandatory and will be controlled. The pass of the colloquia and the process of the workshop task are required for the successful participation.

Conditions
None

T Course: Mechanical Design IV, Constructing the Team [T-MACH-105285]

Responsibility: Albert Albers, Sven Matthiesen
Contained in: [M-MACH-102573] Mechanical Design

ECTS	Language	Recurrence	Exam type	Version
0	Deutsch/Englisch	Jedes Sommersemester	Studienleistung	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2146184	Tutorials Mechanical Design IV	Übung (Ü)	2	Albert Albers, Mitarbeiter
SS 2017	3146021		Übung (Ü)	1	Albert Albers, Mitarbeiter
SS 2017	3146022		Praktische Übung (PÜ)	1	Albert Albers, Mitarbeiter

Learning Control / Examinations
Concomitant to the lecture, a workshop with 3 workshop sessions takes place over the semester. During the workshop the students are divided into groups and their mechanical design knowledge will be tested during a colloquium at the beginning of every single workshop session. The attendance is mandatory and will be controlled. The pass of the colloquia and the process of the workshop task are required for the successful participation.

Conditions
None

T Course: Presentation [T-MACH-108684]

Responsibility: Martin Heilmaier
Contained in: [M-MACH-103722] Bachelor Thesis

ECTS	Recurrence	Exam type	Version
3	Jedes Semester	Studienleistung mündlich	1

Learning Control / Examinations
The colloquium presentation must be held within 6 weeks after the submission of the bachelor thesis. The presentation should last around 20 minutes followed by a scientific discussion with the present expert audience. The students should show that they are able to independently present and discuss the content of their bachelor thesis according to scientific criteria.

Conditions
Bachelor Thesis has been started

Modeled Conditions
The following conditions must be met:

- The course [T-MACH-108685] *Bachelor Thesis* must have been started.

Remarks
The workload for the presentation of the bachelor thesis is about 90 hours.

T Course: Production Operations Management [T-MACH-100304]

Responsibility: Kai Furmans, Gisela Lanza, Frank Schultmann
Contained in: [M-MACH-100297] Production Operations Management

ECTS	Language	Recurrence	Exam type	Version
5	Deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2110085	Production Operations Management	Vorlesung / Übung (VÜ)	4	Kai Furmans, Gisela Lanza
SS 2017	3118031	Production Operations Management	Vorlesung (V)	4	Kai Furmans, Gisela Lanza, Frank Schultmann
WS 17/18	2110085	Production Operations Management	Vorlesung / Übung (VÜ)	4	Kai Furmans, Gisela Lanza

Learning Control / Examinations
written exam

Conditions
none

T Course: Project and Operations Management [T-WIWI-108295]

Responsibility: Stefan Nickel
Contained in: [M-MACH-103322] International Project Management and Soft Skills

ECTS	Recurrence	Exam type	Version
2	Jedes Wintersemester	Studienleistung	1

Learning Control / Examinations
Ungraded, the valuation is composed of:

- 50% written exam
- 25% workshop
- 25% case study

Conditions
None

Remarks
Description:
Operations management (OM) describes the process of planning and controlling the resources needed to produce a company's products or services. While OM focuses on ongoing operations, project management (PM) is concerned with planning and controlling a set of activities with a defined start and end state. The objective of the first part (PM) of the course is to acquaint students with quantitative planning methods to analyze the network structure of large projects, i.e., to identify "critical" project activities, interdependencies between them, and their impact on key performance indicators (e.g., time and cost).
In the second part (OM) of the lecture, two major operational issues are discussed, inventory management and operations scheduling. Students will learn about basic decisions arising in inventory management and operations scheduling, and typical constraints (such as demand or capacity constraints) which have to be taken into account. Throughout the course, students will be given the opportunity to gain practical problem solving skills in short cases and exercises. They will be taught how to use modeling languages in combination with current software tools in order to implement and solve real-world mixed-integer programming models.
Content:
Students will learn how to structure planning problems occurring in a company's operations or in international projects. Moreover, they are introduced to fundamental quantitative planning techniques and tools for solving real-world project and operations management problems.
Topics of the lecture include:

- Introduction to optimization
- Network planning techniques (CPM, PERT, stochastic time analysis etc.)
- Inventory management (single- and multi-period models etc.)
- Operations scheduling (single and parallel machine scheduling etc.)

Learning Targets:
Participants are capable of

- Formulating basic optimization problems frequently occurring in project and operations management contexts (including linear and integer programming, dynamic programming).
- Systematically examining the network structure of large projects (including identification of relationships between project activities, analysis of time-critical activities, computing expected project duration and costs etc.).
- Distinguishing between the different types and uses of inventory as well as the relevant costs associated with inventory.
- Recognizing the fundamental trade-offs in inventory management.
- Calculating order quantities in case of constant and time-varying demand.
- Classifying various kinds of scheduling problems in short-term production planning
- Sequencing jobs based on priority rules
- Developing schedules for single, parallel, and multiple machines.

T Course: SmartFactory@Industry (MEI) [T-MACH-106733]

Responsibility: Gisela Lanza
Contained in: [M-MACH-103351] MF A: Global Production Management

ECTS	Recurrence	Exam type	Version
4	Jedes Sommersemester	Studienleistung	1

Learning Control / Examinations
alternative test achievement (graded)

- colloquium (approx. 15 min)
- presentation (approx. 20 min)

Conditions
Successful completion of the following courses:

- M-MACH-102563 - Computer Science
- MACH-102573 - Mechanical Design

Modeled Conditions
The following conditions must be met:

1. The module [M-MACH-102563] *Computer Science* must have been passed.
2. The module [M-MACH-102573] *Mechanical Design* must have been passed.

T Course: Technical Thermodynamics and Heat Transfer I [T-MACH-104747]

Responsibility: Ulrich Maas
Contained in: [M-MACH-102574] Technical Thermodynamics

ECTS	Language	Recurrence	Exam type	Version
8	Deutsch/Englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 17/18	2165501	Technical Thermodynamics and Heat Transfer I	Vorlesung (V)	3	Ulrich Maas
WS 17/18	3165014	Technical Thermodynamics and Heat Transfer I	Vorlesung (V)	3	Ulrich Maas, Robert Schießl

Learning Control / Examinations
Written exam [duration: 180 min]

Conditions
Successful participation in the tutorial (T-MACH-105204 - Excercises in Technical Thermodynamics and Heat Transfer I)

Modeled Conditions
The following conditions must be met:

- The course [T-MACH-105204] *Excercises in Technical Thermodynamics and Heat Transfer I* must have been passed.

T Course: Technical Thermodynamics and Heat Transfer II [T-MACH-105287]

Responsibility: Ulrich Maas
Contained in: [M-MACH-102574] Technical Thermodynamics

ECTS	Language	Recurrence	Exam type	Version
7	Deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2166526	Technical Thermodynamics and Heat Transfer II	Vorlesung (V)	3	Ulrich Maas
SS 2017	3166526		Vorlesung (V)	3	Robert Schießl

Learning Control / Examinations
Written exam [duration: 180 min]

Conditions
Successful participation in the tutorial (T-MACH-105288 - Exercises in Technical Thermodynamics and Heat Transfer II)

Modeled Conditions
The following conditions must be met:

- The course [T-MACH-105288] *Excercises in Technical Thermodynamics and Heat Transfer II* must have been passed.

T Course: Tutorial Engineering Mechanics I [T-MACH-100528]

Responsibility: Thomas Böhlke, Tom-Alexander Langhoff
Contained in: [M-MACH-102572] Engineering Mechanics

ECTS	Language	Recurrence	Exam type	Version
0	Deutsch/Englisch	Jedes Wintersemester	Studienleistung	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 17/18	2161246	Tutorial Engineering Mechanics I	Übung (Ü)	2	Róbert Bertóti, Thomas Böhlke, Johannes Görthofer, Andreas Prahs
WS 17/18	3161011		Übung (Ü)	2	Maria Loredana Kehrer, Juliane Lang, Tom-Alexander Langhoff, Malte Schemmann

Learning Control / Examinations
Attestations have to be achieved in the following four categories: mandatory written homework problems, written homework problems, computational homework problems, colloquia.
This course is passed if all mandatory written homework problems are passed and if in the other three categories (written homework problems, computational homework problems, colloquia) in total at most three attestations have been finally not passed, at most one in each of the three categories.
Succesful participation in this course allows for registration to the Exam "Engineering Mechanics I" (see T-MACH-100282)

Conditions
None

T Course: Tutorial Engineering Mechanics II [T-MACH-100284]

Responsibility: Thomas Böhlke, Tom-Alexander Langhoff
Contained in: [M-MACH-102572] Engineering Mechanics

ECTS	Language	Recurrence	Exam type	Version
0	Deutsch/Englisch	Jedes Sommersemester	Studienleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2162251	Tutorial Engineering Mechanics II	Übung (Ü)	2	Thomas Böhlke, Andreas Prahs, Malte Schemmann
SS 2017	3162011		Übung (Ü)	2	Tom-Alexander Langhoff, Konstantin Priesnitz

Learning Control / Examinations
Attestations have to be achieved in the following four categories: mandatory written homework problems, written homework problems, computational homework problems, colloquia.
This course is passed if all mandatory written homework problems are passed and if in the other three categories (written homework problems, computational homework problems, colloquia) in total at most two attestations have been finally not passed, at most one in each of the three categories.
Succesful participation in this course allows for registration to the Exam "Engineering Mechanics II" (see T-MACH-100283)

Conditions
None

T Course: Tutorial Engineering Mechanics III [T-MACH-105202]

Responsibility: Wolfgang Seemann
Contained in: [M-MACH-102572] Engineering Mechanics

ECTS	Language	Recurrence	Exam type	Version
0	Deutsch/Englisch	Jedes Wintersemester	Studienleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 17/18	2161204	Engineering Mechanics III (Tutorial)	Übung (Ü)	2	Jimmy Alberto Aramendiz Fuentes, Harry Clausnizer, Wolfgang Seemann
WS 17/18	3161013		Übung (Ü)	2	Jimmy Alberto Aramendiz Fuentes, Harry Clausnizer, Wolfgang Seemann

Learning Control / Examinations
Attestations, succesful accomplishment of exercise sheets

Conditions
None

T Course: Tutorial Engineering Mechanics IV [T-MACH-105203]

Responsibility: Wolfgang Seemann
Contained in: [M-MACH-102572] Engineering Mechanics

ECTS	Language	Recurrence	Exam type	Version
0	Deutsch	Jedes Sommersemester	Studienleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2162232	Engineering Mechanics IV (Tutorial)	Übung (Ü)	2	Jens Burgert, Tim Leister, Wolfgang Seemann
SS 2017	3162013		Übung (Ü)	2	Jens Burgert, Tim Leister, Wolfgang Seemann

Learning Control / Examinations
Attestations, succesful accomplishment of exercise sheets

T Course: Vehicle Comfort and Acoustics I [T-MACH-105154]

Responsibility: Frank Gauterin
Contained in: [M-MACH-103349] MF C: Automotive Engineering

ECTS	Language	Recurrence	Exam type	Version
4	Deutsch	Jedes Wintersemester	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 17/18	2113806	Vehicle Comfort and Acoustics I	Vorlesung (V)	2	Frank Gauterin

Learning Control / Examinations
Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

Conditions
Can not be combined with lecture T-MACH-102206

T Course: Vehicle Comfort and Acoustics II [T-MACH-105155]

Responsibility: Frank Gauterin
Contained in: [M-MACH-103349] MF C: Automotive Engineering

ECTS	Language	Recurrence	Exam type	Version
4	Deutsch	Jedes Sommersemester	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2114825	Vehicle Comfort and Acoustics II	Vorlesung (V)	2	Frank Gauterin

Learning Control / Examinations
Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

Conditions
Can not be combined with lecture T-MACH-102205

T Course: Virtual Engineering (Specific Topics) [T-MACH-105381]

Responsibility: Jivka Ovtcharova
Contained in: [M-MACH-103351] MF A: Global Production Management

ECTS	Language	Recurrence	Exam type	Version
4	Englisch	Jedes Sommersemester	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	3122031	Virtual Engineering (Specific Topics)	Vorlesung (V)	2	Mitarbeiter, Jivka Ovtcharova

Learning Control / Examinations
oral exam, 20 min.

Conditions
none

T Course: Wave and Quantum Physics [T-PHYS-108322]

Responsibility: Gernot Goll, Bernd Pilawa
Contained in: [M-PHYS-104030] Physics

ECTS	Recurrence	Exam type	Version
5	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Conditions
none

T Course: Working Methods in Mechanical Engineering [T-MACH-105296]

Responsibility: Barbara Deml
Contained in: [M-MACH-103322] International Project Management and Soft Skills

ECTS	Language	Recurrence	Exam type	Version
4	Deutsch/Englisch	Jedes Sommersemester	Studienleistung	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2017	2110969	Working Methods in Mechanical Engineering	Vorlesung (V)	1	Barbara Deml
SS 2017	2174970	Working Methods in Mechanical Engineering	Vorlesung (V)	1	Barbara Deml

Learning Control / Examinations
Tests within the workshop sessions concerning the topics of the online-lecture as well as active participation during all four workshop sessions.

Conditions
none

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