Valid from 2024.HS

Module description: Physics 2

Module Code	t.BA.XXP5.PHY2.19HS
ECTS Credits	4
Language of Instruction/Examination	German
Organizational Unit	IAMP
Module Coordinator	Ralf Markendorf
Legal Framework	The module description is part of the legal basis in addition to the general academic regulations. It is binding. During the first week of the semester a written and communicated supplement can specify the module description in more detail.
Module Characteristic	Type 3a 2 lecture lessons per semester week and class+ 2 lab bi-weekly lessons per semester and half-class
Module Description	The students acquire the physical and technical basics in the fields of rotational mechanics, fluid dynamics, stationary magnetic fields and thermodynamics. Using selected examples from these areas, the students learn about and apply the physical way of thinking and working as part of the modern technical thinking of engineers.
Module Content	• Rigid body, motion variables of rotation, rotational dynamics, rotation about fixed axis, torque, moment of inertia, conservation of angular momentum, rolling motion, simple gyro movements, analogies to translational motion • Continua, hydrostatics, hydro- and aerodynamics, ideal fluids, flow field, streamlines, laminar flow, Bernoulli with applications; real fluids, phenomena of internal friction, turbulent flow • Stationary magnetic fields, magnetic field, field lines, calculation of simple magnetic fields: Ampere law, permanent magnets, Lorentz force & moving charges in magnetic fields, technical applications • Temperature and heat, thermal expansion, state equation of ideal gases, state and process variables, inner energy, enthalpy & heat, first law, entropy, second law, heat transport • Testing of physical ideas by rough calculation, experimentation; modelling and simulation; laboratory with error analysis, data acquisition & analysis
Prerequisite Knowledge	Modul PHY1

Learning Objectives (Competences)

Students...	Competencies	Taxonomies
They can grasp physical situations, model physical systems, recognize performance and validity limits of the model, develop and refine models and obtain qualitative and quantitative results from the models.	M, F	K2, K3
The students get to know the inductively determined physical thinking and working method as part of the modern thinking and working method of the engineer and are able to apply it. This includes such important methods as experimentation, modelling, idealisation and analogy. In principle, they are able to check the correctness of results from experiments and models by means of rough calculations, limit case considerations and evaluation of their plausibility by comparison with empirical values from technology or everyday life.	F, M	K2, K3
They are able to gain new insights through physical experimentation and computer simulation by observing, recognising (retrieving) physical relationships, acquiring data and their numerical evaluation and interpretation.	M, F	K2, K3
The students have understood the fundamental relations of physics in the form of basic laws, conservation laws and physical concepts and can apply them to concrete situations.	M, F	K2, K3

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Performance Assessment

End-of-module exam	Assessment	Length (min.)	Weighting	Form
written exam	Grade	90	100	acc. to module agreement

Performance assessment during the semester	Assessment	Length (min.)	Weighting	Form
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Classroom Attendance Requirement	None
Learning material	
Comments	