Valid from 2024.HS

Module description: Physics 1

Module Code	t.BA.XXP6.PHY1.19HS
ECTS Credits	4
Language of Instruction/Examination	German
Organizational Unit	IAMP
Module Coordinator	Christoph Georg Stamm
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	Basic physics and methods for the following: 1) Kinetics and 2) dynamics of one and two-dimensional motion of mass points (with circular motions and vibrations, incl. resonance) 3) Conservation principles and balancing.
Module Content	• Physics as a natural science: Experiments, models and theory and its relevancies for engineering sciences (inductive dn deductive thinking) Kinematics: fundamental relations for one dimensional motions described by differential and integral notations. Vector charateristics of the kinematic quantities discussed onbehalf of cirular motions (repetition of the prerequisites) Momentum as conserved quantity: Analysis of momemntum in central elatsic and inelastic collisions. ⌄ Balances of momentum: Principle of cutting free (Actio = Reactio), Relations between forces and momentum described in differential and integral notations.Force: Gravitational forces in homogenious fields ,spring- and friction forces.
Prerequisite Knowledge	Professional Maturity (technical profile)

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Learning Objectives (Competences)

Students...	Competencies	Taxonomies
4) The students can apply the knowledge and skills from 1) to 3) qualitatively and quantitatively to natural and technical phenomena. The students are able to decide, based on the particular problem statement, which methods are suitable for the analysis. (e.g. they can distinguish dynamic problems from the analysis of states).	M	K3, K4
3) The students understand the concept of analogy in physics and can exemplify it. They know the structures of conservation laws and can identify these structures in concrete physics examples.	M	K2, K3
Overview General physics education and the knowledge of the methods in physics are prerequisites for interdisciplinary thinking and performing of a future engineer. Based on selected examples from nature and technology, the students learn about and employ the physics way of thinking and working as part of the engineer's modern technical thinking.	F	K4
1) The students know the definitions of basic quantities and concepts in the areas listed below and understand how these are motivated. They can distinguish between definitions and fundamental physical relationships (natural laws).	F	K1, K2
2) The students understand and recognize the relations between the concepts developed in 1) in different forms and can identify them. The forms include dynamic relationships, conservation laws, and geometric concepts.	F	K1, K2
5) The students understand the significance of an experiment and can evaluate it. They recognize possible disturbing effects and are able to reduce them or to consider them. They can handle data-acquisition and data-analysis tools and are able to document their activities and to interpret the results. They are able to organize themselves in a team, to communicate and to take responsibility.	M, SO, F	K3, K4

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Performance Assessment

End-of-module exam	Assessment	Length (min.)	Weighting	Form
written exam	Grade	90	60	acc. to module agreement

Performance assessment during the semester	Assessment	Length (min.)	Weighting	Form
written exam	Grade	9	20	acc. to module agreement
report	Grade		15	acc. to module agreement
Further Contributions during the courseContributions during Quizzes/Presentations/Dicussions *According information by the lecturer*	Grade		5	

Classroom Attendance Requirement

None

Attendance is compulsory for group internships

Learning material

Comments