Technology
Arts Sciences
TH Köln

Course Manual PH1

Physics 1

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General information

Long name	Physics 1
Approving CModule	PH1_BaET
Responsible	Prof. Dr. Karl Kohlhof Professor Fakultät IME
Valid from	summer semester 2021
Level	Bachelor
Semester in the year	summer semester
Duration	Semester
Hours in self-study	60
ECTS	5
Professors	Prof. Dr. Karl Kohlhof Professor Fakultät IME
Requirements	Functions (sin, cos, exp, ln) Equations and systems of equations (linear, quadratic) Analysis (differential and integral calculus) Linear algebra (2-/3-dim vector calculation)
Language	German
Separate final exam	Yes

Literature

- Tippler, Mosca; Physik (Springer Spektrum)
- Giancoli; Physik Lehr- und Übungsbuch (Pearson)
- Halliday, Resnick, Walker; Halliday Physik (Wiley-VCH)

Final exam

Details	Written examination, oral examination only in individual cases, with the following elements: - Multiple choice and assignment questions to query fundamental concepts, relationships and analogies - Free-text answers to query further knowledge and the basic understanding of physical relationships - Preparation of sketches to test further understanding - Application-oriented text tasks, whose solutions make it necessary to analyze and reduce the physical problems, select a suitable model and apply it mathematically.
Minimum standard	50 % of the questions and tasks correctly solved
Exam Type	EN Klausur

− Lecture / Exercises

Learning goals

Goal type	Description
Knowledge	Mechanics of rigid bodies - Physical quantities and units - Kinematic (temporal description of linear and rotary motion) - Analogy of linear and rotary motion - One-dimensional motion - Multidimensional motion and projectile motion - Dynamics (forces, apparent forces, frictional forces, Newton's axioms) - Work, energy, energy conservation - Momentum, momentum conservation and impact processes - Torque and moment of inertia - Angular momentum and its conservation - Oscillations of mass-spring systems (free/forced, undamped/damped) - Resonance behavior, quality factor, resonance curve - Analogy of mechanical and electrical oscillation systems Mechanism of deformable body - Elastic and plastic deformation - Tension, pressure - Mechanics of fluids and gases (Bernoulli)
Skills	Recognize and apply analogies, e.g. linear and rotary motion Derive balance of power and set up equations of motion Derive energy balances and determine the states of motion from energy conservation Derive momentum balances and determine motion states from the momentum conservation Analyze simple physical problems, apply physical models and calculate with them

Special requirements

none

Accompanying material	Presentation slides for the lecture Collection of exercise tasks with solutions Questionnaire to prepare the exam Links to Internet resources with basic information
Separate exam	No

Expenditure classroom teaching

Type	Attendance (h/Wk.)

Lecture	3
Exercises (whole course)	2
Exercises (shared course)	0
Tutorial (voluntary)	0