Technology
Arts Sciences
TH Köln

Course
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
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

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

Written examination, oral examination only in individual cases, with the following elements:
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- Preparation of sketches to test further understanding
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Lecture / Exercises

Learning goals

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

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	3
Exercises (whole course)	2
Exercises (shared course)	0
Tutorial (voluntary)	0

Separate exam

none