

2.1.3 Physics

Physics

Module Summary
Module code: EEIB130
Module coordinator: Prof. Dr. Christian Karnutsch
Credits (ECTS): 6 Points
Semester: 1. Semester
Pre-requisites with regard to content: Basic knowledge of Mathematics and Physics
Pre-requisites according to the examination regulations: Regarding to the examination regulations no pre-requisites are required
Competencies: The students can apply the principles of geometrical optics, kinematics and dynamics to exemplary practical situations by implementing the formulas, relationships and basic principles conveyed in the lecture, in order to master the approach and the basic methods for solving physical problems. This enables the students to independently work on physics topics and to solve relevant questions. The physics laboratory enables students to perform basic physics experimentation techniques and to document those in a proper technical context.
Assessment: The theoretical knowledge of the physics lecture is assessed in a 120-minute exam. The practical skills in handling the measuring equipment and the laboratory experiments are assessed through colloquia and a final laboratory test (duration 45 minutes).
Usability: The lecture conveys basic understanding of physical terms such as force, energy, (angular) momentum and their laws of conservation, as well as refraction and reflection, oscillations and waves. These basic physics fundamentals and skills are necessary and helpful for numerous advanced lectures.

Course: Physics
Module code: EEIB131
Lecturer: Prof. Dr. Christian Karnutsch, Prof. Dr. Harald Sehr
Scope of weekly semester hours (SWS): 4
Semester of delivery: Winter semester
Type/mode: Lecture, Compulsory subject
Language of instruction: English
Content: <ul style="list-style-type: none"> • Geometrical optics

<ul style="list-style-type: none"> • Mechanics: kinematics; dynamics • Basic terms: force, energy, momentum, angular momentum, laws of conservation, mechanical tension, strain, Hooke's law • Basics of oscillations and waves and their properties
<p>Recommended reading:</p> <ul style="list-style-type: none"> • Halliday, David; Resnick, Robert; Walker, Jearl: Fundamentals of Physics Extended; 10th Edition, Wiley • Tipler, Paul; Gene Mosca: Physics for Scientists and Engineers; 6th edition, W.H. Freeman Particularly for the field of Optics: • Hecht, Eugene: Optics; Pearson Education

Course: Physics Lab
Module code: EEIB132
Lecturer: Prof. Dr. Christian Karnutsch, Prof. Dr. Harald Sehr
Scope of weekly semester hours (SWS): 2
Semester of delivery: Winter semester
Type/mode: Laboratory, Compulsory subject
Language of instruction: English
<p>Content:</p> <p>Experiments in the following topics:</p> <ul style="list-style-type: none"> • Optical lenses and lens systems • Determination of the electron mass • Vertical falling ball viscometer • Mass moment of inertia and torsional oscillations
<p>Recommended reading:</p> <ul style="list-style-type: none"> • Smith, Walter F.: Experimental Physics: Principles and Practice for the Laboratory; CRC Press • French, Matthew: Physics Lab Experiments; Mercury Learning & Information