

Modulbezeichnung: Stundenplankürzel: (Title)	G4: Physics Physics
Modulverantwortliche(r): (Module responsibility)	Prof. Dr. rer. nat. Markus Mauerer
Dozent(in): (Course teachers)	Prof. Dr.-Ing. Jörg Elias Prof. Dr. rer. nat. Markus Mauerer Prof. Dr. rer. nat. Matthias Rebhan Part time lecturers
Sprache: (Language of instruction)	English
Zuordnung zum Curriculum: (Degree programme)	Bachelor Engineering and Management 2nd Semester
Lehrform/SWS: (Teaching method / Hours per week (SWS))	Seminar-like lecture / 4 SWS
Arbeitsaufwand: (Workload)	Presence time for lectures and exercises: 60 hours Self-studies, preparation of lectures and exam: 90 hours
Kreditpunkte: (Number of ECTS credits)	5 ECTS
Voraussetzungen: (Prerequisites)	Basic knowledge of differential and integral calculus, as well as vector algebra
Verwendbarkeit: (Usability)	The module uses mathematical methods and thus builds on the contents of the module engineering mathematics 1 (Mathematik 1). Basic knowledge for various technical modules of higher semesters is imparted, in particular for the module "Energietechnik" (energy technology).
Lernziele/Kompetenzen: (Course objective)	Competence Level 1 „Know“: <ul style="list-style-type: none"> • The students know the basic laws of physics. • The students understand the importance of physics as the scientific basis for the work of an engineer. Competence Level 3 „Apply“: <ul style="list-style-type: none"> • The students can solve physical problems by calculations. • The students are able to investigate optional technical innovations in view of physical laws. Competence Level 4 „Analyse“: <ul style="list-style-type: none"> • The students can systematically analyse physical-technical problems by recognizing, formulation and application of basic laws and transformation into mathematical language.
Inhalt: (Course content)	Mechanics: <ul style="list-style-type: none"> • kinematics of a point mass • free fall and inclined throw

	<ul style="list-style-type: none"> • motion in 3 dimensions • cyclic motion • dynamics of a point mass – Newton´s laws • momentum and conservation of momentum • forces • work • energy and energy conservation • power • dynamics of rigid bodies <p>Thermodynamics:</p> <ul style="list-style-type: none"> • the ideal gas model • laws of thermodynamics • enthalpy and useful work • entropy • ideal cyclic processes of ideal gases • real gases, example: water • gas-vapour mixtures, example: moist air
<p>Prüfungsform: (<i>Assessment method</i>)</p>	<p>Written Exam in presence Duration: 90 minutes</p>
<p>Literatur: (<i>Recommended reading</i>)</p>	<p>HALLIDAY, D., RESNICK, R. und WALKER, J., 2018. <i>Physics</i>, 11th edition. John Wiley and Sons. ISBN 978-1-119-28624-0</p> <p>WILHELMS G. und CERBE, G., 2017: <i>Technische Thermodynamik: Theoretische Grundlagen und praktische Anwendungen</i>, 18. Auflage. München: Carl Hanser Verlag GmbH & CO. KG. ISBN: 978-3-446-45119-3</p>