Valid from 2024.HS

Module description: Material Technology for EU

Module Code	t.BA.EU.MATTECH.19HS
ECTS Credits	4
Language of Instruction/Examination	German
Organizational Unit	IMPE
Module Coordinator	Daniel Matthias Meier
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 3b 2 lecture lessons per semester week and class+ 4 lab bi-weekly lessons per semester and half-class
Module Description	Students acquire the ability to understand, analyse and answer current, problem-based questions of energy and environmental technology using materials science and chemistry models and tools.They study the relevant properties of materials and substances in combined theoretical and practical work.
Module Content	**Lecture** • Fundamentals of the structure and effect of atoms, molecules and matter • Position and properties of atoms in the periodic table • Molecular compounds • Reactions and balances • Storage of energy in chemical compounds • Phase states, state diagram • Materials & Materials • Conductors (electrical and ionic), non-conductors, insulators • Environmental aspects • Environmentally relevant compounds and countermeasures • Solid, liquid, gaseous hazards & toxicities (human/environment) • Definition of risk and assessment of toxic materials and substances • Tensile strength test
Prerequisite Knowledge	https://gpmpublic.zhaw.ch/GPMDocProdDPublic/2_Studium/2_02_Grundlagen_Studium/T_CL_Modulauspraegungen_SM2025.pdf

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Learning Objectives (Competences)

Students...	Competencies	Taxonomies
Students work out the concepts of chemical bonds and can analyse the associated energies	F, M	K3, K4
You can precisely document experiments, evaluate and present experimental data and reflect the results	F, SE, M	K3, K4
Based on the material properties, you can evaluate both energy and environmental aspects and assess them for applications	M, SE, F	K3, K4
You apply the theoretical knowledge in teamwork and with practical experiments	SE, M, SO	K3
You are familiar with modern materials and concepts and can use them specifically for applications in the field of energy and environmental technology	SE, F, M	K3, K4
Students are able to evaluate the properties of materials on the basis of models from materials science and chemistry	F, M	K1, K2
Students can understand and evaluate the mass-, charge- and energybalances of simple reactions	M, F	K2, K3

Performance Assessment

End-of-module exam	Assessment	Length (min.)	Weighting	Form
written exam	Grade	90	70	acc. to module agreement

Performance assessment during the semester	Assessment	Length (min.)	Weighting	Form
Moodle Quiz *Moodle quiz for the preparation and follow-up of the laboratory courses*	Grade		30	acc. to module agreement

Classroom Attendance Requirement

None

The attendance requirement applies to laboratory lessons

Learning material

Comments