

# CHEMISTRY

## General Chemistry

Module assigned to 1st semester

Identification Code	2288870040
ECTS-Points	0
Credit Hours	0
Language	English
Length of the Module	1 semester
Date and Capacity	winter term 60 students
Responsible Lecturer	Prof. Dr. Gerhard Taubmann
Further Lecturer	Prof. Dr. Gerhard Taubmann
Study Programme	Master degree in Advanced Materials Master degree in Energy Science and Technology compulsory
Prerequisites	BSc degree
Study Objectives	The students should - learn and understand the fundamentals of general chemistry and chemical synthesis with respect to the preparation of organic polymeric and inorganic materials
Module Contents	<b>Atoms:</b> - properties of the atoms, - hydrogen, many electron atoms, - periodic table <b>Hydrogen:</b> - isotopes, chemical kinetics - gas laws, ideals gas, van der Waals - synthesis and properties of hydrogen - metal hydrides - acids and bases <b>Halogens:</b> - synthesis and properties - oxidation and reduction, oxidation numbers - balancing redox reactions - hydrogen halides, hydrogen bond, azeotropes, - mass action law, principle of least restraint - dissociation of water, pH <b>Chalcogens:</b> - synthesis and properties of oxygen - liquefaction of gases, fractionation by distillation - diamagnetism and paramagnetism - ozone, mesomerism - water, phase diagram, phase law - colligative properties - hydrogen sulphide - oxides and oxo acids of sulfur - shape of molecules: VSEPR (valence shell electron pair repulsion) - weak acids and bases, pKa, pKb - indicators, buffers, Henderson-Hasselbalch-equation

	<ul style="list-style-type: none"> <li>- acidity of oxo-acids: Bell-Pauling rules</li> <li>- electromotive series, Nernst's equation</li> <li>- coordination chemistry</li> </ul>
Literature	Handouts Charles E. Mortimer: <i>Chemistry: A Conceptual Approach</i> Brooks Cole; 6th ed. (Dez. 1986)
Teaching Methods	General Chemistry (L), 2 h/week
Estimation of working load	20 h lecture (presence) 24 h preparation and postprocessing lecture 16 h exam preparation  Total: 60 h
Examinations	written examination
Grade Composition	Passed or failed
Usability	MSc course of studies Energy Science and Technology