

Table 5.2 Course specification

Type and level of studies: Bachelor			
Course name: Chemistry of novel materials			
Course status: elective			
Number of ECTS credits: 5			
Requirement: none			
Course aim The aim of this course is to introduce students with different types of novel inorganic and organic materials, their syntheses, properties and application. Familiarisation with the terms from nanoscience and nanotechnology; basic division of inorganic and organic nanomaterials; syntheses of nanomaterials; application and trends in nanotechnology. Moreover, the aim of this course is to introduce students with the fundamental techniques of nanomaterial characterisation: AFM, GPC/SEC, SEM, DLS, TEM.			
Course outcome After the course, students will be able to perform the knowledge on contemporary, modern, as well as promising materials. Students will be able to plan and create the materials with specific predefined properties.			
Course content <i>Theory</i> Terms and significance of materials science. Silicon and silicon-based materials. Carbon and carbon-based materials. Oxide ceramic. Magnetic inorganic and organic materials. Inorganic and organic coatings and films. Langmuire-Blodgett films. Polymeric materials. Superconducting inorganic and organic materials. Composite materials. Bioceramic. Introduction to nanoscience and nanotechnology, terms in the physics of condensed matter, quantum effects of nanomaterials, shape and structure of inorganic nanomaterials. Divisions, significance, and syntheses of inorganic nanomaterials, trends and application. <i>Practice: Practical classes, OFT, SRW</i> Simple syntheses of thermochromic materials. Simple syntheses of organic semiconductors. Investigation of physical properties of nanoparticles of metal oxides, graphene, nanotubes, and fullerenes. Syntheses of nanocomposites, intercalate and covalent derivatives of C ₆₀ .			
Literature 1. <i>Nanostructures and Nanomaterials: Synthesis, Properties and Application</i> , Gouzhong Cao, Ying Wang, World Scientific Publishing Co. Pte. Ltd. (2011) ISBN-13: 978-981-4322-50-8 2. Scientific and patent data bases			
Number of classes of active teaching			Other classes
Lectures: 3 (45)	Practice: 1 (15)	OFT: SRW:	
Teaching methods Lectures, seminars, consultations.			
Assessment of knowledge (maximum of 100 points)			
Pre-exam obligations	Points	Final exam	Points
activity during lecture classes	20	written exam	40
practical teaching	20		
seminars	20		