

Module: Lab Training for Inorganic and Organic Synthetic Chemistry			
University/Department/Institute: Freie Universität Berlin/Department of Biology, Chemistry, Pharmacy/Institute of Chemistry and Biochemistry			
Module supervisors: Lecturers of the module			
Entrance Requirements: successful completion of the module "Lab Training in Organic Chemistry"			
<p>Goals of Qualification: Students are able to perform data bank related research to find out a suitable synthesis sequence for a given target molecule. They are able to critically evaluate the results, design simple, multi – step synthesis, to search the necessary literature independently and to translate the information found in the literature into an experimental design. They are able to perform complex laboratory techniques for safe handling of light-, humidity-, or temperature - sensitive reaction media or products and are able to use instrumental methods to determine the structure of the yielded compounds. They have basic knowledge of hetero – nuclear NMR spectroscopy and its usage in inorganic chemistry. They are able to present their results on protocols and orally in seminars in a technically correct manner. Students have acquired knowledge in the history of chemistry and socially relevant topics, which are presented in consideration of gender-specific aspects.</p>			
<p>Contents: Literature based research on the executed synthesis steps, planning and execution of multi – step organic and inorganic synthesis while considering aspects of laboratory safety, professional laboratory techniques, (e.g. exclusion of water and air (Schlenk technique), usage of vacuum), safe handling of gases, chromatographic methods, characterization of chemical structures via spectroscopic methods (IR-/Raman-spectroscopy, heteronuclear NMR spectroscopy), written documentation of the experimental results, presentation of topics of inorganic and organic chemistry relevant to the lab training in seminars, while considering gender- and diversity aspects in these presentations by including important historical and societal subjects.</p>			
Teaching methods	Hours of attendance (Hours per week)	Forms of active participation	Workload (hours)
Lecture	1	Exam	Presence (L) 15 Pre-, post-preparation (L) 15 Presence (S) 45 Pre-, post-preparation (S) 30
Seminar	3	Contributions to topic related discussions	Presence (Lab) 165 <i>supervised lab training</i> 60 <i>self-study in lab</i> 45
Safety relevant lab training	11	research on theoretical background, preparation and conduction of experiment (14-18 experiments)	Pre-, post-preparation (Lab) 45 Exam preparation and examination 45
Language offer of lecture		German, if required by circumstances: English	
Compulsory regular attendance		Lecture attendance is recommended, Lab training, Seminar: yes	
Workload (total)		420 hours	14CP
Length of module		One semester	
Examination		Practical examination (Presentation of theoretical background, experimental results and protocols)	
Lecture is offered		Every semester	
Applicability		Bachelor study program Chemistry	