

## Module variant to: Practical to Aspects of Biology

<b>Module:</b> Laboratory biosafety, biosecurity and laboratory training on working with infectious microbial agents			
<b>University/Department/Teaching Unit:</b> Freie Universität Berlin/Biology, Chemistry, Pharmacy/Biology			
<b>Module coordinator:</b> Susann Dupke, Min-Hi Lee			
<b>Prerequisites:</b> none			
<b>Learning objectives:</b> Students possess additional knowledge, skills, and implementation-oriented competencies beyond their specialized academic studies that are conducive to professional activities. They will be able to apply new biological fields of activity and techniques in a context-specific manner and present them professionally. They are able to functionally apply their job-related competences in different fields of application. At the end of the module, students will be able to perform a risk assessment when handling and transporting of microbial pathogens with regard to biological safety and security. In doing so, they have acquired knowledge of the relevant national and international regulations and are able to assess the necessary safety equipment of laboratories and personal protective equipment. Hands-on training in the laboratory deepens this knowledge, which is a requirement for working with microbial pathogens.			
<b>Content:</b> By use of harmless pathogens, the handling of microbial agents of risk groups 1, 2 and 3 is simulated and practiced. For this purpose, risk group-related safety measures on technical, organisational and personal level will be elaborated. Fundamentals about different types of personal protective equipment (PPE), proper fitting as well as donning and doffing of appropriate PPE components is imparted. Decontamination procedures are applied and their effectiveness tested. Examples of pathogenic and highly pathogenic agents are used to explain the most important national and international sources for risk assessment of practical laboratory work. The internal transport up to the international shipment of pathogenic and highly pathogenic samples is practiced with examples. Emergency procedures are presented and practised with exemplary equipment in a safe environment. The focus is not only on questions of safe handling from the point of view of occupational health and safety (biosafety) but also on public health aspects and the prevention of misuse of corresponding pathogens or scientific findings (biosecurity, dual use). Measures for the prevention of unintentional releases of pathogenic agents up to the detection and defense against bioterrorism are explained and discussed. To illustrate and merge all aspects of this module in a working context when handling pathogens, a guided tour of a level 3 high-security laboratory will take place.			
<b>Modes of instruction</b>	<b>Contact hours</b> (hours per week during the semester)	<b>Types of active participation</b>	<b>Workload</b> (in hours)
Lecture (V)	1	Discussion, oral presentation, written assignment regarding the oral presentation	Class attendance (lecture) 15 Preparation, before and after (lecture) 25
Safety lab (sP)	3	Carrying out experiments, solving practice assignments, writing an annotated evaluation report	Class attendance (safety lab) 45 Preparation, before and after (safety lab) 40 Exam preparation and exam 25
<b>Module assessment</b>		Written exam (60 minutes), wholly or partially in multiple-choice format; can also be carried out electronically or written report on research results (approx. 10 pages) or examination colloquium (approx. 20 minutes)	
<b>Language</b>		English	
<b>Regular attendance required</b>		Yes	
<b>Total workload</b>		150 hours	5 credit points
<b>Duration</b>		one semester	
<b>Frequency</b>		Irregular	
<b>Applicability</b>		Master's degree program M.Sc. Biology	

Utilization in the following specializations (decision by the examining board):

Biodiversity, Evolution and Ecology	x
Genetics and Genomics	x



Microbiology	x
Molecular- and Cellular Biology	x
Molecular Plant Sciences	x
Neurobiology	x
Biology	x