

SYLLABUS – A COURSE DESCRIPTION

I. General information

1. Course name: **Viruses in Biotechnology**
2. Course code: **01-BTA-VIRBT**
3. Course type (compulsory or optional): **compulsory**
4. Study programme name: **Biologia**
5. Cycle of studies (1st or 2nd cycle of studies or full master's programme): **2nd cycle of studies**
6. Educational profile (general academic profile or practical profile): **general academic profile**
7. Year of studies (if relevant): **I**
8. Type of classes and number of contact hours (e.g. lectures: 15 hours; practical classes: 30 hours):
lectures: 10 hours
laboratory classes: 15 hours
conservatorium: 5 hours
9. Number of ECTS credits: **3**
10. Name, surname, academic degree/title of the course lecturer/other teaching staff:
dr hab. Justyna Broniarczyk, justekbr@amu.edu.pl
dr hab. Robert Nawrot, nawrot@amu.edu.pl
11. Language of classes: **English**
12. Online learning – yes (partly – online / fully – online) / no: **not available**

II. Detailed information

1. Course aim (aims)
 Course aim (aims):
 1. Familiarize students with safety rules in the laboratory of virology.
 2. Familiarize students with the properties of Virus-Like Particles (structure, production and characterization).
 3. Explain the role of viruses in biological science.
 4. Discuss the role of Virus-Like Particles in vaccine production.
 5. Explain the role of viruses as carriers of therapeutic agents and genes.
 6. Discuss the role of viruses in nanotechnology.
2. Pre-requisites in terms of knowledge, skills and social competences (if relevant)
 The students should be familiar with basic virology.
3. Course learning outcomes (EU) in terms of knowledge, skills and social competences and their reference to study programme learning outcomes (EK)

Course learning outcome symbol (EU)	On successful completion of this course, a student will be able to:	Reference to study programme learning outcomes (EK)
EU_01	define and use the safety rules in laboratory of virology	BT_K05
EU_02	explain Virus-Like Particles (structure, production and characterization)	BT_W01, BT_W02
EU_03	describe and explain the role of viruses in biological science	BT_W02, BT_W03
EU_04	characterize the role of Virus-Like Particles in vaccines production	BT_W01, BT_W06, Bt_U01
EU_05	explain the role of viruses as carriers of therapeutic agents and genes	BT_W06, BT_U01
EU_06	explain the role of viruses in nanotechnology	BT_W01, BT_W06

4. Learning content with reference to course learning outcomes (EU)

Course learning content	Course learning outcome symbol (EU)

The difference between BSL2 and BSL3 laboratories	EU_01
The properties of virus like particles (types of VLPs, production platforms)	EU_02
The positive role of viruses in biological science (studies on: viral life cycle, cell biology, antiviral activity of different compounds)	EU_03
The role of virus-like particles in vaccines production	EU_04
Viruses as carriers of therapeutic agents and genes	EU_05
The role of viruses in nanotechnology (viruses as scaffolds and templates for nanomaterials)	EU_06

5. Reading list

1. Cann AJ: Principles of Molecular Virology, Elsevier, Amsterdam-Boston-London, 2012
2. Dimmock NJ, Primrose SB: Introduction to Modern Virology, Blackwell Science, Oxford, 1998
3. Fields BN et al.: Fundamental Virology, Lippincott-Raven, Philadelphia-New York, 1995
4. Flint SJ et al: Principles of Virology, ASM Press, Washington, 2009

III. Additional information

1. Teaching and learning methods and activities to enable students to achieve the intended course learning outcomes (please indicate the appropriate methods and activities with a tick or/and suggest different methods)

Teaching and learning methods and activities	
Lecture with a multimedia presentation	X
Interactive lecture	X
Problem – based lecture	X
Discussions	
Text-based work	
Case study work	
Problem-based learning	
Educational simulation/game	
Task – solving learning (eg. calculation, artistic, practical tasks)	
Experiential work	X
Laboratory work	X
Scientific inquiry method	
Workshop method	X
Project work	X
Demonstration and observation	
Sound and/or video demonstration	
Creative methods (eg. brainstorming, SWOT analysis, decision tree method, snowball technique, concept maps)	
Group work	X

2. Assessment methods to test if learning outcomes have been achieved (please indicate with a tick the appropriate methods for each LO or/and suggest different methods)

Assessment methods	Course learning outcome symbol					
	EU_1	EU_2	EU_3	EU_4	EU_5	EU_6
Written exam		X	X	X	X	X
Oral exam						

Open book exam						
Written test						
Oral test						
Multiple choice test		X	X	X	X	X
Project						
Essay						
Report		X	X	X	X	X
Individual presentation		X	X	X	X	X
Practical exam (performance observation)	X					
Portfolio						
Discussion activity		X	X	X	X	X

3. Student workload and ECTS credits

Activity types	Mean number of hours spent on each activity type
Contact hours with the teacher as specified in the study programme	30
Preparation for classes	10
Reading for classes	15
Essay / report / presentation / demonstration preparation, etc.	15
Project preparation	
Term paper preparation	
Exam preparation	20
Total hours	90
Total ECTS credits for the course	3

4. Assessment criteria according to AMU in Poznan grade system

Very good (bdb; 5,0): Clear attainment of the course outcomes, showing complete and comprehensive understanding of the course content, with development of relevant skills and intellectual initiative to an extremely high level.

Good plus (+db; 4,5): Substantial attainment of the course outcomes, showing a high level of understanding of the course content, with development of relevant skills and intellectual initiative to a high level.

Good (db; 4,0): Sound attainment of the course outcomes, showing good understanding of the course content, with development of relevant skills and intellectual initiative to good level.

Satisfactory plus (+dst; 3,5): Some attainment of the course outcomes, showing some understanding of the course content, with development of relevant skills and intellectual initiative to rather good level.

Satisfactory (dst; 3,0): Weak attainment of the course outcomes, showing acceptable understanding of the course content, with development of relevant skills and intellectual initiative to acceptable level.

Unsatisfactory (ndst; 2,0): Very weak attainment of the course outcomes, showing not passable understanding of the course content, with development of relevant skills and intellectual initiative to not acceptable level.