

Nazwa zajęć/ <i>Course title:</i>	Wirusologia ogólna	ECTS	2
Nazwa zajęć w j. angielskim/ <i>Course title in English:</i>	General virology		
Zajęcia dla kierunku studiów/ <i>Degree program name:</i>	Biotechnology		

Język kursu/ <i>Course language:</i>		English		Poziom studiów/ <i>Study level:</i>		I	
Typ studiów/ <i>Form of studies:</i>	X intramural .. extramural	Status zajęć/ <i>Course status</i>	podstawowe/ <i>Basic</i> X kierunkowe/ <i>major</i>	X obowiązkowe/ <i>mandatory</i> do wyboru/ <i>elective</i>	Semestr/ <i>Semester:</i>	4 semestr zimowy/ <i>winter semester</i> x semestr letni/ <i>summer semester</i>	
Rok akademicki/ <i>Academic year:</i>				2022/2023	Numer katalogowy/ <i>Catalogue number:</i>	BBT_BTa-1S-4L-33	

Koordynator zajęć/ <i>Course coordinator:</i>	Prof. dr hab. Marcin Bańbura
Prowadzący zajęcia/ <i>Teachers responsible for the course:</i>	Prof. dr hab. Marek S. Szyndel, Staff of the Department of Virology

Założenia, cele i opis zajęć/ <i>Aims, objectives and description of the course:</i>	<p>The content of the training includes basic information in the field of general virology, enabling the understanding of the nature of viruses as intracellular infectious agents different from microorganisms.</p> <p>In the lecture part, the content of the course includes basic data and definitions describing the features of the virus as a subcellular, infectious biological microstructure, differences between viruses and microorganisms, as well as the morphology and chemical composition of virions. The structure and functions of the viral genome, virus replication - types of infections and their consequences for the cell, including productive infection, non-productive infection with the mechanisms and consequences of the virus-cell interaction, including viral oncogenesis, were explained. Infectious subviral agents as well as contemporary threat problems related to viral infections are also discussed</p> <p>The tutorial part covers the demonstration and basic techniques of virus multiplication in cell culture in vitro and basic techniques for identifying viral antigens by immunofluorescence. Some activities are planned to be performed by students on their own.</p> <p>To acquaint students with the latest information about the nature, morphology and replication of plant viruses with different genomes. Presentation of the basic methods of detecting plant viruses</p> <p>Lecture topics: Structure of plant viruses and viroids: particle morphology, genome, capsid. Taxonomy of viruses and viroids. The multiplication of viruses with different types of genomes. Viroid replication. Expression strategies of viral genomes. Virus variability. Methods and techniques of working with plant viruses. Running virus cultures. Methods of isolating and purifying viruses. Immunological methods: serum production, serological techniques. Physicochemical methods: spectrophotometry and electron microscopy. Application of the PCR technique in virology.</p> <p>Topics of exercises: Isolation and purification of viruses from plant material. Use of low temperature, reducing agents and buffering substances to stabilize viruses during purification procedures. Separation of extracts in two-phase solvent systems. Methods of precipitating viruses from suspensions. Centrifuges as a tool for working with viruses. Preparation of viral preparations for electron microscopy, visit to the Laboratory of Electron Microscopy of the Warsaw University of Life Sciences</p>
--	--

Formy dydaktyczne, liczba godzin/ <i>Teaching forms, number of hours:</i>	<p>a) lectures number of hours 15</p> <p>b) laboratory classes number of hours 15</p>
---	---

Metody dydaktyczne/ <i>Teaching methods:</i>	Lecture, experience / experiment of the possibility of using distance learning when necessary. Team isolation and purification of plant viruses, individual carrying out of simple serological tests, independent preparation of electron-microscopic preparations
--	--

Wymagania formalne i założenia wstępne/ <i>Formal requirements and prerequisites</i>	Basic knowledge of cell biology, including processes such as DNA replication, transcription, and protein synthesis. biochemistry, botany, molecular biology
--	---

Efekty uczenia się/ <i>Learning outcomes:</i>	treść efektu przypisanego do zajęć/ <i>the content of the effect assigned to the course:</i>	Odniesienie do efektu kierunkowego/ <i>Relation to the course outcomes</i>	Siła dla ef. kier*/ <i>Impact on the course outcomes*</i>
---	--	--	---

Wiedza (absolwent zna i rozumie) / <i>Knowledge: (the graduate knows and understands)</i>	W1	knows the basic properties of viruses that distinguish them from microorganisms	K_W06	3
	W2	knows and understands the different replication method of viruses compared to microorganisms	K_W09 K_W10	2 2
Umiejętności (absolwent potrafi) / <i>Skills: (the graduate is able to)</i>	U1	can choose the right method of virus multiplication depending on the needs and possibilities	K_U02 K_U01	3 3
	U2	is able to apply the basic methods of virological diagnostics	K_U02 K_U01	3 3

Kompetencje (absolutnie jest gotów do) /Competences: (The graduate is ready to)	K1	is ready to convey his knowledge in the field of virology in a way that is understandable to the average recipient	K_K01 K_K02 K_K06	3 3 3
Treści programowe zapewniające uzyskanie efektów uczenia się: /Program contents ensuring the achievement of the learning outcomes:		Information in the field of general virology to understand the non-microbial nature of viruses as intracellular infectious agents. Issues such as: data and definitions describing the characteristics of the virus as a subcellular infectious biological microstructure, differences between viruses and microorganisms, and the morphology and chemical composition of virions. Structure and functions of the viral genome, virus replication - types of infections and their consequences for the cell, including productive infection, non-productive infection with the mechanisms and consequences of virus-cell interaction, including viral oncogenesis. Infectious subviral agents and contemporary threat problems related to viral infections.		
Sposób weryfikacji efektów uczenia się/ Methods of the verification of the learning outcomes:		written final test, assessment resulting from observation during classes		
Szczegóły dotyczące sposobów weryfikacji i form dokumentacji osiągniętych efektów uczenia się /Details on the verification methods and of the ways of documenting the learning outcomes:		The content of the exam questions with the assessment, the possibility of using distance education (TEAMS) in necessary cases (pandemic). Students' written works stored and made available as needed		
Elementy i wagi mające wpływ na ocenę końcową/Elements and weights influencing the final grade:		Part of prof. Bańbura Written final exam - 90%; Assessment resulting from observation during classes - 10%; Part of professor Szyndel, evaluation of work on preparation of preparations for ME and virus cleaning 10% exam 90%		
Miejsce realizacji zajęć/ Teaching place:		classroom and laboratory, the possibility of using distance learning when necessary		
Literature / <i>Literature</i> :		1. Collier L., Oxford J. Wirusologia, PZWL 2001 2. Kryczyński S. Wirusologia roślinna. PWN, 2010 (M.S. Szyndel był recenzentem podręcznika) 3. Piekarczyk A., Podstawy wirusologii molekularnej. Wydawnictwo Naukowe PWN, Warszawa, 2004 4. Kryczyński S. Zasady identyfikacji i klasyfikacji wirusów roślin. Fundacja 'Rozwój SGGW', Warszawa, 2005 5. Bos L. Plant viruses, unique and intriguing pathogens. A textbook of plant virology. Backhuys Publishers, Leiden, 1999 6. Hull R. Matthews' Plant Virology. Elsevier Academic Press, Amsterdam, 2002 7. Hull R. Comparative Plant Virology. Elsevier Academic Press, 2009 8. Kryczyński S. Podstawy fitopatologii. Rozdziały 2.3 Wirusy jako patogeny roślin i 2.4 Wiroidy jako patogeny roślin (str. 33-72). Fundacja „Rozwój SGGW”. Wyd. III, Warszawa 2005.		
UWAGI/ANNOTATIONS		The following scale is used to calculate the final score: 100-91% points - 5.0; 90-81% points - 4.5, 80-71% points - 4.0; 70-61% points - 3.5; 60-51% points - 3.0		

*) 3 – zaawansowany i szczegółowy, 2 – znaczący, 1 – podstawowy/ 3 – significant and detailed, 2 – considerable, 1 – basic,

Wskaźniki ilościowe charakteryzujące moduł/przedmiot/*Quantitative summary of the course*:

Szacunkowa sumaryczna liczba godzin pracy studenta (kontaktowych i pracy własnej) niezbędna dla osiągnięcia zakładanych dla zajęć efektów uczenia się - na tej podstawie należy wypełnić pole ECTS / <i>Estimated number of work hours per student (contact and self-study) essential to achieve the presumed learning outcomes - basis for the calculation of ECTS credits</i> :	50 h
Łączna liczba punktów ECTS, którą student uzyskuje na zajęciach wymagających bezpośredniego udziału nauczycieli akademickich lub innych osób prowadzących zajęcia/ <i>Total number of ECTS credits accumulated by the student during contact learning</i> :	1.2 ECTS