



SZKOŁA GŁÓWNA
GOSPODARSTWA
WIEJSKIEGO

Viruses of Plants and Virus-Vector Interactions

Educational subject description sheet

Basic information

Field of study Course Offer for exchange students - second cycle studies, including uniform master studies (MA programmes)		Didactic cycle 2024/25	
Speciality -		Subject code PWMPWM2S_D.B100000.06341.24	
Organizational unit Course Offer for exchange students		Lecture languages english	
Study level second cycle studies, including uniform master studies (MA programmes)		Mandatory Elective subjects	
Study form full-time studies		Block Basic subjects	
Education profile General academic		Disciplines	
Coordinator	Mariusz Lewandowski, Tobiasz Druciarek		
Teacher	Mariusz Lewandowski, Tobiasz Druciarek		
Period Winter semester	Examination Pass with grade	Number of ECTS points 3	
	Activities and hours Lecture: 16 Laboratory exercises: 10 Field exercises: 4		

Goals

Code	Goal
C1	1. To appreciate the breadth of viruses infecting plants and their economic impact 2. To know how plant viruses spread in the environment and how this relates to problems of diagnosis, epidemiology, and control of plant diseases 3. To understand the modes of transmission and interactions between viruses and vectors on biological and molecular levels 4. To provide information on how to prevent or manage disease caused by viral infections in agricultural and horticultural settings 5. To know and converse with others about this field's essential questions and concepts

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge - Student knows and understands:			
W1	Knows and understands the importance of plant viruses and their economic impact		Test (written or computer based)
W2	Knows and understands how plant viruses spread in the environment		Test (written or computer based)
W3	Knows and understands the modes of transmission and basic interactions between plant viruses and vectors on biological and molecular levels		Test (written or computer based)
Skills - Student can:			
U1	Is able to diagnose major vector groups and provide their characteristics		Report, Assessment of work in the laboratory
U2	Is able to converse with others about this field's essential questions and concepts and can use tools and databases to learn further		Assessment of work in the laboratory
Social competences - Student is ready to:			
K1	Is ready to design a control strategy for viral disease in crops based on the virus and/or vector characteristics		Test (written or computer based)

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	This course presents current information on insect, mite, and nematode vectors of plant viruses and the role of these vectors in agricultural and horticultural areas. The material discussed in this course will help students understand problems of diagnosis, epidemiology, and control of important diseases of our crops. After finishing the course, students will be able to identify and characterize the major vector groups. They will understand different modes of virus transmission and features that affect vector competence. They will also learn how viruses and their vectors interact on biological and molecular levels and what factors facilitate transmission. Students will gain basic knowledge of the strategies and role of vector control and prevention in disease management. Prospects and future directions in this field will also be discussed.	W1, W2, W3, K1	Lecture
2.	Practical course of nucleic acid extraction from plant tissue and vector body and amplification of cDNA fragment use for virus identification.	U1, U2	Laboratory exercises, Field exercises
3.	Diagnosis of virus symptoms in a field	U1	Field exercises

Course advanced

Activities	Methods of conducting classes
Lecture	Lecture
Laboratory exercises	Laboratory (experiment), learning by experiment
Field exercises	Field observations

Activities	Examination method	Percentage
Lecture	Test (written or computer based)	35%
Laboratory exercises	Assessment of work in the laboratory	35%
Field exercises	Report	30%

Activities	Credit conditions
Lecture	51% from the test
Laboratory exercises	reports from experiments conducted in the lab
Field exercises	report from field trip

Literature

Obligatory

1. Wilson, C.R. (2014). Applied Plant Virology. CABI
2. Lobenstein and Katis (eds). (2014). Control of Plant Virus Diseases. Advances in Virus Research. Vol. 90. 530 pp.
3. Agrios, G.N. (2008). Transmission of plant disease by insects. In J.L. Capinera, ed. Encyclopedia of Entomology, 2nd edition. Kluwer Academic.3853-3885

Optional

1. Butter, N.S. (2018). Insect vectors and plant pathogens. 2nd edition, CRC Press, Boca Raton
2. Bragard, et al. (2013). Status and prospects of plant virus control through interference with vector transmission. Annu. Rev. Phytopathol 51: 177-201
3. Rajarapu, S. P., et al. (2021). Plant-Virus-Vector Interactions. Virology: 227-287

Calculation of ECTS points

Activity form	Activity hours*
Lecture	16
Laboratory exercises	10
Field exercises	4
Preparation for exercises	15
Preparing a report	15
Preparation for the exam	20
Student workload	Hours 80
Number of ECTS points	ECTS 3

* hour means 45 minutes