

Course name: Biological and Biotechnical Methods of Plant Protection

ECTS	5.0
Course status	<i>facultative</i>
Course final assessment /evaluation of outcomes	The grade based on Student's work
Prerequisite	<i>biology at high school level, basic information on plant pests</i>

Main field of study:

Agriculture and Horticulture

Educational profile	General academic
Code of studies and education level	bachelor/engineer (SI) or master of science (SM)
Semester of studies	winter or summer
Language of instruction	English

Course offered by:

Name of faculty offering the course	Faculty of Biotechnology and Horticulture
Name of department offering the course	Department of Botany, Physiology and Plant Protection
Course coordinator	Maria Pobożniak (DSc, PhD), Jacek Nawrocki (DSc, PhD)

Learning outcomes:

Symbol of outcome	Description of the learning outcome	Reference to main field of study outcomes	Area symbol*
KNOWLEDGE – student knows and understands:			
BMOR_W1	the basic definitions in the field of biological and biotechnical methods of plant protection	EPB2_W03	RP
BMOR_W2	micro- and macroorganisms and substances of microbial, plant and animal origin, which are used in biological plant protection	EPB2_W03	RP
BMOR_W3	the methods of reproduction of microorganisms, parasitoids and predators used in biological plant protection	EPB2_W03	RP
BMOR_W4	the biotechnical preparations: hormone analogues, chitin synthesis inhibitors and pheromones used in biological plant protection	EPB2_W01	RP
SKILLS – student is able to:			
BMOR_U1	assess the effectiveness of biopesticides in protecting crops against important pathogens in laboratory conditions.	EPB2_U05	RP
BMOR_U2	determine the effectiveness of selected biologically active compounds on major plant pathogens in greenhouse conditions.	EPB2_U01, EPB2_U05	RP
BMOR_U3	evaluate the effectiveness of the Steinernematidae family and Beauveria fungi on major plant pests.	EPB2_U01	RP
BMOR_U4	assess the effect of toxic Bt proteins on selected insect groups.	EPB2_U05, EPB2_U11	RP
SOCIAL COMPETENCIES – student is ready to:			

BMOR_K1	organization of work in a small team to perform the exercise	EPB2_K02	RP
BMOR_K2	expand his knowledge of substances and micro and macroorganisms used in biological protection of plants	EPB2_K01	RP

Teaching contents

Lectures		24 hours	
Topics	Basics of biological pest control. Possibilities of using natural enemies of pests and pathogens to protect horticultural, agricultural and forest crops. The importance and potential for reproduction of major antagonists of important pests and diseases: baculoviruses, bacteria, fungi and fungus-like organisms, nematodes, predatory insects, mites and parasitoids. Analogues of insect hormones and pheromones and analogues of chitin and other biopesticide synthesis inhibitors used in plant protection.		
Accomplished learning outcomes		<i>BMOR_W1, BMOR_W2, BMOR_W3, BMOR_W4</i>	
Means of verification, rules and criteria of assessment		test (30% participation in the final assessment)	
Classes: 15 hours			
Topics	The use of pheromone traps and sticky boards to monitor and determine the pest threat threshold and to adjust the doses of introduced predatory insects and parasitoids. Evaluation of the effectiveness of the use of bioagents (predators and parasitoids) as well as microorganisms and preparations of microbial origin (bacteria, baculoviruses, entomopathogenic fungi and nematodes) in the control of plant agrophages. Evaluation of the effectiveness of biopesticides in the protection of crops against pathogens in laboratory conditions. Research on effectiveness of selected biologically active compounds on plant pathogens in greenhouse conditions.		
Accomplished learning outcomes		<i>BMOR_U1, BMOR_U2, BMOR_WU3, BMOR_U4</i>	
Means of verification, rules and criteria of assessment		activity and exercise report (30% participation in the assessment)	
Seminar		6 hours	
Topics	Biologiczna ochrona wybranych upraw (ważnych gospodarczo) w kraju pochodzenie studenta		
Accomplished learning outcomes		BMPP_W1-W5	
Means of verification, rules and criteria of assessment		Presentation (40% participation in the final assessment))	

References:

Basic	<i>Heylet N. et al. 2014. Biological; control in Plant Protection. Second Edition, CRC Press.</i> <i>Pal, K. K. and B. Mc Spadden Gardener, 2006. Biological Control of Plant Pathogens. The Plant Health Instructor. DOI:10.1094/PHI-A-006-1117-02.</i>
Supplementary	<i>BioControl - Journal of the International Organization for Biological Control (IOBC). Springer</i>

Structure of learning outcomes

Area of academic study: R – Agricultural, forestry and veterinary sciences	3.0 ECTS **
Area of academic study: P	2.0 ECTS **

Structure of student activity

Contact hours	55	hrs.	2.2	ECTS**
Including:				
lectures	15	hrs.		
classes and seminars	21	hrs.		
consultations	5	hrs.		
participation in research		hrs.		
obligatory traineeships		hrs.		
participation in examination	5	hrs.		
e-learning		hrs.		ECTS**
student own work	70	hrs.	2..8	ECTS**

*Areas of academic study in the fields of: H- humanities; S - social studies; P – biological sciences; T – technological sciences; M- medical, sport and health sciences; R – Agricultural, forestry and veterinary sciences; A – the arts

** stated with an accuracy to 0.1ECTS, where 1 ECTS = 25 - 30 hours of classes