Sveučilište u Zagrebu Agronomski fakultet
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Management of Plant Diseases (146056)

Nositelj predmeta

prof. dr. sc. Snježana Topolovec-Pintarić

Opis predmeta

The module delivers knowledge in the field of plant protection against plant pathogens divided into four units. Introductory lectures of first unit present review of the evolution of plant pathogens chemical control and emphasise the importance and necessity of chemical control against pathogen in modern agriculture (positive and negative aspects on environment). Also, lectures deliver chemical and functional classification of fungicides according to their mode of action. Second unit of lectures deals with strategies and techniques for control of bacteria, virus, virus-like organisms and non-cellular organisms. Lectures of third unit elaborate: i) basic principles of biological control of plant pathogens, ii) overview of beneficial microorganisms which are considered as biocontrol agents, iii) overview of antagonistic mechanisms. Last unit represents prospects in plant pathogens control and enlighten the development of new technologies for production of environmental-friendly products (self-protecting plants, transgenic resources, enzyme-based product).

ECTS: **3.00**

Sati nastave: 30
Predavanja: 20
Auditorne vježbe: 2
Laboratorijske vježbe: 4
Vježbe u praktikumu: 2
Seminar: 2

Izvođač predavanja

- prof. dr. sc. Snježana Topolovec-Pintarić
- prof. dr. sc. Edyta Đermić

Izvođač vježbi

- prof. dr. sc. Snježana Topolovec-Pintarić
- prof. dr. sc. Edyta Đermić
- Katarina Martinko, mag. ing. agr.

Ocjenjivanje

Dovoljan (2): 60 %
Dobar (3): 70 %
Vrlo dobar (4): 80 %
Izvrstan (5): 90 %

Vrsta predmeta

- Graduate studies / Environment, agriculture and resource management (Obvezni predmet, 3. semestar, 2. godina)

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Opće kompetencije

Students will gain knowledge and skills that allow competence in choosing adequate chemical product, technique or method suitable for environmental-friendly control of particular plant disease.

Oblici nastave

- Lectures
  consists of introduction about different type of pesticides for protection against plant pathogens, basic knowledge on fungicides and their mode of action, fungicide resistance, basic concept and fundamental knowledge of biological control and bio-originated fungicides, and strategies and techniques for control acellular and prokaryotic pathogens.
- Auditory Exercises
  will be e-learning supported for allowing student to explore world-wide market of bio-products, trend and future prospects in plant disease management.
- Laboratory practice/exercises
  aims to promote students' ability of conducting methods for: 1) evaluation of antagonistic abilities of potential bio-agents (dual-culture, production of volatile metabolites), 2) evaluation of fungal sensitivity to fungicides (germ-tube assay).
- Practicum
- Seminars
  will be organised as online forum debates (e-learning) in which everyone present is requested to actively participate and conduct individual assignments. It has the function of bringing together students in focusing each time on some particular subject, and where assigned readings are discussed, questions can be raised and debated can be conducted. Excellent forum activity gain benefits and one can be exempted from the written exam.

Ishodi učenja i način provjere

Ishod učenja	Način provjere
Gain knowledge and skills that allow competence in choosing chemical product	Written exam; Online debates; Individual assignment
Gain knowledge and skills that allow competence in choosing application technique	Written exam; Online debates; Individual assignment
Gain knowledge and skills that allow competence in choosing controling method	Written exam; Online debates; Individual assignment

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Način rada

Obveze nastavnika

Instructional obligation of teacher is to transfer theoretical knowledge in classroom and on e-course at Merlin platform. Teacher need to maintain instructional design of e-course by choosing and using appropriate Information Communications Technology and facilitate e-learning. Entire educational material (text-book, working sheet's map, repetition materials and materials for self-evaluation) textual and multimedia as well, should be prepared by course teacher. Teacher obligation is to conduct practical laboratory exercises in the manner that allow best development of student's skills and for that need to assure fungicides and other needed chemicals, forecasting models, filamentous fungal bio-agents and nutrient media to be used in methods for evaluation of antagonistic abilities of potential bio-control agent and working sheet map.

Obveze studenta

Students have an obligation to attend their scheduled course learning activities. Students are obliged to regularly attend lectures and practical classes and to participate in online activities at e-course: forum debates and seminars. Therefore, signing into e-course at Merlin during first two weeks of semester is obligatory. All work that is set by the teacher must be completed by the due date. Should students experience difficulty in completing their work it is recommended they speak with the teacher. Students have an obligation to respect their teachers' right to determine course content, methodology and evaluation. Students have an obligation to respect their teachers' right to formulate and enforce policies on lateness and attendance. Penalties for absences may include failure in the course.

Polaganje ispita

Elementi praćenja	Maksimalno bodova ili udio u ocjeni	Bodovna skala ocjena	Ocjena	Broj sati izravne nastave	Ukupni broj sati rada prosječnog studenta	ECTS bodovi
Classroom attendance	25%			18	2	0.72
Online debates	50%	0 post 1 post 2 posts 3 posts >3 posts	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)	39	10	1.56
Individual assignment	25%	0 post 1 post 2 posts 3 posts >3 posts	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)	18	18	0.72
Final/written exam	75%	0-60 61-70 71-80 81-90 91-100	Nedovoljan (1) Dovoljan (2) Dobar (3) Vrlo dobar (4) Izvrstan (5)	57	28	2.28

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Elementi praćenja	Maksimalno bodova ili udio u ocjeni	Bodovna skala ocjena	Ocjena	Broj sati izravne nastave	Ukupni broj sati rada prosječnog studenta	ECTS bodovi
Total	100%			75	30	3

Elementi praćenja	Opis	Rok	Nadoknada
Individual assignment	OR Excellent online debates activity and individual assignment gain benefits and one can be exempted from the written exam.		
Individual assignment	Student will be asked to write seminar and essay or conduct oral presentation.	According to deadline given by teacher during semester.	Final exam.

Tjedni plan nastave

1. Fungicides L, M, Pe.L - Retrospective of plant disease management. Development of fungicide.
2. Fungicides L, M, Pe.L - Chemical and functional classification of fungicides according to their mode of action.
3. Fungicides L, M, Pe.L, Lab - Formulations of fungicides, doses and volumes of distribution, deposit, residue.
4. Fungicides L, M, Pe.L Lab - Compatibility of ingredients. Side effects of fungicidal mixtures.
5. Fungicides L, M, Pe.L - Resistance to fungicides (genetic and physiological bases, monitoring methods, preventive measures).
6. Fungicides Lab - Resistance to fungicides (methods in vitro, germ tube assay). Eco-toxicological assessment of fungicides.
7. Control of prokaryotes and non-cellular plant pathogens L, M - Basic principles of management of viruses and virus-like diseases.
8. Control of prokaryotes and non-cellular plant pathogens L, M - Preventive and curative measures for management of bacterioses.
9. Control of prokaryotes and non-cellular plant pathogens M, S - Decision supporting systems: forecasting models, expert systems and warning systems.
10. Biological control L, Pe.L – Bio-control: historic overview.
11. Biological control L, Pe.L - Biocontrol agents, natural substances and synthetic fungicides. Definitions, regulations, strength and weakness aspects.
12. Biological control Lab, M, Pe-L - Methods for evaluation of antagonistic abilities of potential bio-agents: dual-culture, production of volatile metabolites.
13. Biological control E, M, I, Pe-L - Exploring world-wide market of bio-products.
14. Biological control E, M, I, Pe-L - Exploring world-wide market of bio-products.
15. Trends and future prospects in plant disease management L, S, I, M, Pe-L -Environmental-friendly strategies for plant disease management: transgenic resources, enzyme-based products, self-protecting plants.

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Obvezna literatura

1. Fungicides / Book 2, 2011. ISBN 979-953-307-554-8,Book edited by: Dr. N. Thajuddin
2. Persley J. G. 1999. Biotechnology and Integrated Pest Management. CAB International
3. Helyer N., Brown K., Cattlin N. D., 2009 A Colour Handbook of Biological Control in Plant Protection Wiley (Manson). 128 pp
4. Chet, I. 1993. Biotechnology in Plant Disease Control. Wiley-Liss, New York, 373 pg
5. Topolovec-Pintarić S. 2011. Resistance to botryticides In: Fungicides, In Tech

Preporučena literatura

1. IOBC/WPRS Bulletins

Sličan predmet na srodnim sveučilištima

- Don’t exist to our current knowledge.

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