INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Plant Pests and Diseases			Field of study	Plant Protection								
Bachelor in	Agronomic Engineering			School	School of Agriculture								
Academic Year	2022/2023	Year of study	2	Level	1-2	ECTS credits	6.0						
Type	Semestral	Semester	1	Code	9086-307-2105-00-22								
Workload (hours)	162	Contact hours	T 30	TP -	PL 30	TC -	S -	E -	OT 20	O -			

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s): Maria Eugénia Madureira Gouveia

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. know and identify organisms associated with key-pests and diseases.
2. Know their bioecological characteristics, their symptoms, injuries and economic losses
3. Integrate the knolweldge to implement methods and techniques for diagnosis of plant pathogens.
4. Learn biological cycle of key-pests and diseases to implement control measures.

Prerequisites

Before the course unit the learner is expected to be able to:
Students should have knowledge in general microbiology

Course contents

Etiology of plant diseases. Symptoms, damages and crop losses, disease cycle and epidemiology. Diagnostic techniques in plant pathology, isolation of pathogens and their preliminary identification, immunological and molecular techniques. Control methods of plant diseases. Insects and mites as plant pests. Morphology, reproduction and development. Taxonomic groups of insects and mites that are important plant pests. Damages and crop losses associated with plant pests.

Course contents (extended version)

1. Introductory concepts in plant protection
   - Plant pests and crop protection.
   - The agricultural ecosystem (agroecosytems)
   - Economic importance of plant diseases and pests
2. Plant pathology and groups of plant pathogens
   - Plant diseases and plant symptoms.
   - Plant disease diagnosis and etiology of diseases.
   - Disease cycle of parasitic diseases
   - Dissemination and survival of the parasite
3. Plant pathogenic fungi .
   - Morphology, type of spores and taxonomy.
   - Life cycle of fungi that cause plant diseases
   - Epidemiology
   - General strategies for disease control of fungal plant diseases. Fungicide active substances.
4. Bacterial plant pathology
   - Morphology and general biological characteristics
   - Disease symptoms and disease epidemiology.
   - Cultural and chemical control of bacterial disease
   - Eradication and quarantine
5. Plant viruses
   - Mechanisms of penetration, translocation and distribution in crop plants
   - Detection and identification of plant viruses
   - Control strategies: cultural eradication, quarantine and certification
6. Plant pests. Damages and losses in plants.
7. Insects: morphology, reproduction, development and life cycle.
   - Duration of the life cycle and succession of generations
   - Taxonomy and classification of insects
   - Main Insect orders with economic importance as plant pest
   - General strategies for insect pest control
8. Mites in plant crops
   - Morphology, life cycle and number of generations, taxomony, and pest biology,
   - Damages and control.
   - Strategies for general pest control and integrated pest management.

Recommended reading

1. Agrios, N. George, 2005 – Plant Pathology, Elsivier, Academic Press, 5ª Edição
2. Fox, R. , T. , V. , 1993 – Principles of Diagnostic Techniques in Plant Pathology. International Mycological Institute. Surrey, UK.
3. Garcia-Tejero F. D. , 1998. Plagas Y Enfermedades de las Plantas Cultivadas. 9ª Ed. , Ediciones Mundi-Prensa.
4. European and Mediterranean Plant Protection Organization - "Site oficial"
5. Recursos B.on - pesquisa bibliográfica de estudos publicados em revistas relacionados com sanidade vegetal

Teaching and learning methods

Lectures by audiovisual and multimedia techniques and laboratory complemented with fieldwork in the orchards, IPB campus and greenhouses. Bibliographic research and seminars.

Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final)
   - Intermediate Written Test - 40%
   - Final Written Exam - 60%
2. Type 2 - (Regular, Student Worker) (Supplementary, Special)

Assessment methods

- Final Written Exam - 100%

Language of instruction

Portuguese

Electronic validation

Maria Eugénia Madureira Gouveia	Álvaro José Lopes César	Albino António Bento	José Carlos Batista Couto Barbosa
09-12-2022	15-12-2022	20-12-2022	20-12-2022