Syllabus

Subject

Subject / Group	22475 - Agricultural and Ornamental Plagues / 8
Degree	Degree in Food and Agriculture Engineering and the Rural Environment - Fourth year
Credits	6
Period	2nd semester
Language of instruction	English

Professors

Lecturers	Office hours for students					
	Starting time	**Finishing time**	**Day**	**Start date**	**End date**	**Office / Building**
Miguel Ángel Miranda Chueca *Responsible* ma.miranda@uib.es	You need to book a date with the professor in order to attend a tutoring session.					
María del Mar Leza Salord mar.leza@uib.es	11:15	12:15	Thursday	02/09/2019	30/07/2020	30/Guillem Colom

Context

Plant Health is one of the cornerstones of agricultural production. Different groups of organisms produce important losses in crops and gardens. Arthropods such as insects and mites are major pest of the most important crops either in conventional and organic cropping systems. The current pest control methods aim to avoid losses and harmful effects of pests on crops and gardens. Basic knowledge of taxonomy and bioecology of plant pests is needed for a proper implementation of control measures. In this subject, main groups of Arthropods causing damage to crops are gardens are studied from the point of view of its identification, diversity and control methods.

In Block I, the basic concepts of agrosystems and their relationship with plant pest occurrence is addressed. Also, the bases for a correct classification of pests is explained.

Block II is dedicated to the study of the evolution of the methods of pest control, with special relevance on the most used current methods.

Block III includes the identification, biology and control methods of the main groups of pests that affect agricultural crops, forests and gardens.

Requirements

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Skills

Specific

* C2: Las bases de la producción vegetal, los sistemas de producción, de protección y de explotación. .
* C10: Transferencia de tecnología, entender, interpretar, comunicar y adoptar los avances en el campo agrario.
* H1: Capacidad para conocer, comprender y utilizar los principios de tecnología de la Producción Hortofrutícola.
* H8.2: Capacidad para conocer, comprender y utilizar los principios de material vegetal: producción, uso y mantenimiento.

Generic

* G11: Capacidad para desarrollar sus actividades, asumiendo un compromiso social, ético y ambiental en sintonía con la realidad del entorno humano y natural. .

Transversal

* T2: Capacidad de análisis y síntesis. Capacidad de razonar de forma crítica .

Basic

* You may consult the basic competencies students will have to achieve by the end of the degree at the following address: http://www.uib.eu/study/grau/Basic-Competences-In-Bachelors-Degree-Studies/

Content

The contents are organized in three blocks: Block I is dedicated to concepts such as pest definition, elements of the agroecosystem and a brief introduction to the main groups of animals of importance for agricultura. In Block II we explain the basis of pest control, giving special relevance to the most novel techniques, both commercially and experimentally. Finall, Block III includes the main groups of pests that affect crops and gardens

Range of topics

Block I. Introduction and basic concepts.. Block I. Introduction and basic concepts.

Topic 1. Introduction. Topic 1. Introduction

Introduction to Agricultural and Ornamental Pests. Interest of the subject and relationship with other disciplines. Planning and evaluation criteria.

Topic 2. Generalities of agrarian systems. Topic 2. Generalities of agrarian systems

Agroecosystems and the concept of pest. Main production systems and their relationship with pests of importance. The soil and its importance: introduction to the soil fauna. The problem of introduced pests.

Topic 3. Basis for classification. Topic 3. Basis for classification

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Basis for the classification of the organisms of importance in agrarian production and in gardening systems.

Topic 4. Sampling of pests. Topic 4. Sampling of pests

Methods of detection and evaluation of a pest. Concepts of economic treatment threshold and damage level. Mechanisms and types of sampling: traps and attractants. Introduction to control methods. Importance of preventive methods. Examples of pest monitoring and control programs.

Topic 5. Main groups of organisms. Topic 5. Main groups of organisms

Main groups of organisms of economic importance in the agricultural and forestry systems.

Block II. Main methods of pest control. Block II. Main methods of pest control

Topic 6. Pesticides. Topic 6. Pesticides

Conventional pesticides: types, mechanisms of action and problems. Biorational pesticides : types and mechanisms of action. Other types of pesticides

Topic 7. Biological and Biotechnological Control. Topic 7. Biological and Biotechnological Control

The Biological Control. Natural enemies: entomopathogens, parasitoids and predators. Strategies of Biological Control: Classic Biological Control, Augmentation, Preservation. Methods of Biotechnological Control.

Topic 8. Integrated Control and Integrated Production. Topic 8. Integrated Control and Integrated Production

Concepts of Integrated Control and Integrated Production. Examples of integrated control of some agricultural pests and ornamental plants.

Block III. Main arthropods of economic importance. Block III. Main arthropods of economic importance

Topic 9. General morphology. Topic 9. General morphology

Basis of the general morphology of the main groups of economic importance in agriculture and ornamentals.

Topic 10. Main species of plant feeders. Topic 10. Main species of plant feeders

This topic will cover main species of arthropods than feed on leaf tissues.

Topic 11. Main species of sap feeders. Topic 11. Main species of sap feeders

This topic will cover main species of sap feeder arthropods, including those that transmit important virosis.

Topic 12. Main species of wood borers. Topic 12. Main species of wood borers

This topic will cover main species that are wood borers.

Topic 13. Main species of leaf miners. Topic 13. Main species of leaf miners

This topic will cover main species that are leaf miners

Topic 14. Main species of root feeders. Topic 14. Main species of root feeders

This topic will cover main species that are root feeders

Topic 15. Main species of gall producers.. Topic 15. Main species of gall producers.

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This topic will cover main species that are gall producers

Teaching methodology

The subject includes the usual methods for lectures (board, PPT files, videos, „„), as well as practical classes in the laboratory and field trips. Regarding the non-on site activities, they focus on the study of the contents of the subject, completing the general and specific competences, as well as carrying out a practical work whose guidelines are indicated by responsible of the subject.

For the proper development of the subject, it is advisable to take into account the general regulations of the UIB

General regulations:

1.- Academic regulation of the University. FOU nº 365 2.- Safety in the laboratory:

http://prevencio.uib.es/digitalAssets/192/192003_fitxa_laboratoris.pdf http://prevencio.uib.es/Seguretat/Riscos-a-laboratoris.cid233043

2.- Regulations regarding plagiarism.

General Provisions of the UIB: https://seu.uib.cat/fou/acord/109/10959.html

Workload

Theory lessons are 40 h and practical ones 15 h.

70h are devoted to teh resolution of practical cases and 20h to the construction and feed of a picture database.

In-class work activities (2.4 credits, 60 hours)

Modality	Name	Typ. Grp.	Description	Hours
Theory classes	Theory lessons	Large group (G)	To provide information to develop skills on pest control. To promote general and specific skills acquisition in the students considering interdisciplinary contents. Lectures will be conducted by using all available technology. Active participation of students would be encouraged.	45
Practical classes	Practical lessons	Medium group (M)	The practical lessons are devoted to the recognition of main arthropods related to agroecosystems and ornamentals that have been explained in the theory lessons. A field trip also allows to recognize those arthropods in their habitat.	15

At the beginning of the semester a schedule of the subject will be made available to students through the UIBdigital platform. The schedule shall at least include the dates when the continuing assessment tests will be conducted and the hand-in dates for the assignments. In addition, the lecturer shall inform students as to whether the subject work plan will be carried out through the schedule or through another way included in the Aula Digital platform.

Distance education tasks (3.6 credits, 90 hours)

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Modality	Name	Description	Hours
Individual self-study	Resolution of practical cases	Students will work in the resolution of practical cases on plant pest recognition, control and prevention suggested by the responsible of the subject. A written report will be delivered and complemented with an oral presentation of the main findings of the report.	70
Group self-study	Picture Database	To increase knowledge of arthropods and other organisms that are related to agrosystems and ornamental plants. Students in groups of four will create a database where pictures of arthropods related to agrosystems and ornamental plants will be posted.	20

Specific risks and protective measures

The learning activities of this course do not entail specific health or safety risks for the students and therefore no special protective measures are needed.

Student learning assessment

The exam includes both theory and practical lessons. It has a minimum score of 5 and represents a 50% of the subject it is compulsory for the students.

The report about practical cases has a minimum score of 5 and represents 35% of the subjectand it is compulsory for the students.

The picture database has no minimum score and represents the 15% of the subject and it is optional for the students.

Frau en elements d'avaluació

In accordance with article 33 of Regulation of academic studies, "regardless of the disciplinary procedure that may be followed against the offending student, the demonstrably fraudulent performance of any of the evaluation elements included in the teaching guides of the subjects will lead, at the discretion of the teacher, a undervaluation in the qualification that may involve the qualification of "suspense 0" in the annual evaluation of the subject".

Theory lessons

Modality	Theory classes
Technique	Other methods **(recoverable)**
Description	To provide information to develop skills on pest control. To promote general and specific skills acquisition in the students considering interdisciplinary contents. Lectures will be conducted by using all available technology. Active participation of students would be encouraged.
Assessment criteria	Theory lessons and practical ones are evaluated through an exam that includes test, short and long questions.

Final grade percentage: 50%with a minimum grade of 5

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Resolution of practical cases

Modality	Individual self-study
Technique	Papers and projects **(recoverable)**
Description	Students will work in the resolution of practical cases on plant pest recognition, control and prevention suggested by the responsible of the subject. A written report will be delivered and complemented with an oral presentation of the main findings of the report.
Assessment criteria	The writen report and the oral presentation will be scored separately and the mean is calculated for the final score. There will be several deadlines along the course to avoid work load at the end of the course.

Final grade percentage: 35%with a minimum grade of 5

Picture Database

Modality	Group self-study
Technique	Papers and projects **(recoverable)**
Description	To increase knowledge of arthropods and other organisms that are related to agrosystems and ornamental plants. Students in groups of four will create a database where pictures of arthropods related to agrosystems and ornamental plants will be posted.
Assessment criteria	Pictures of the database are scored according to the given description included in a template that is provided. There will be several deadlines along the course to avoid work load at the end of the course.

Final grade percentage: 15%

Resources, bibliography and additional documentation

All books are available at the UIB.

Basic bibliography

De Liñán Vicente, Carlos Entomología agroforestal. Ediciones Agrotécnicas. 1998
García Marí, F., Ferragut Pérez, F. Las plagas agrícolas. Valencia : Phytoma, 2002
Howse, P. E., Stevens, I.D.R., Jones, O.T. . Insect pheromones and their use in pest control. London : Chapman and Hall, 1993.
Jacas, J.A. and Urbaneja, A. Control biológico de plagas agrícolas. Phytoma, 2008
Van Emden, Helmut Fritz. Handbook of agricultural entomology. Wiley-Blackwell, 2013

Complementary bibliography

IPM for gardeners : a guide to integrated pest management / Raymond A. Cloyd, Philip L. Nixon, and Nancy R. Pataky. . Portland : Timber Press, 2004.
Sustainable management of arthropod pests of tomato / editors, Waqas Wakil, Gerald E. Brust, Thomas M. Perring. 2018
Trapping and the Detection, Control, and Regulation of Tephritid Fruit Flies : Lures, Area-Wide Programs, and Trade Implications / edited by Todd Shelly, Nancy Epsky, Eric B. Jang, Jesus Reyes-Flores, Roger Vargas. Springer. 2014

Other resources

Links to scientific and technical journals will be provided to the students.

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