Universidad deValladolid

Course Syllabus

Subject Name	**MOLECULAR MARKERS & DIAGNOSTIC OF PLANT DISEASES**
Module	OPTIONAL
Qualification	BACHELOR DEGREE IN FOREST & NATURAL ENVIRONMENT ENGINEERING

Plan	449	**Código**	42212
Teaching Period	2º SEMESTER	**Tipo/Carácter**	OP
Level/Stage	BACHELOR	**Curso**	3º

ECTs Credits	3
Language of Instruction	ENGLISH
Lecturers in charge	**Fernando M. Alves Santos** Elena Hidalgo Rodríguez
Contact details (e-mail, telephone …)	Fernando M. Alves Santos ext: 8421 fmalvess@pvs.uva.es Elena Hidalgo Rodríguez ext.8387 ehidalgo@pvs.uva.es
Tutorial Timetable	TO BE CONSULTED AT http://www5.uva.es/etsiiaa/ AND http://campusvirtual2017.uva.es/
Departament	DEPARTMENT OF VEGETAL PRODUCTION AND NATURAL RESOURCES iuFOR (UNIVERSITARY INSTITUTE OF FOREST RESOURCES CONSERVATION & USE)

1. Situatión / Course

1.1 Context

Instrumental techniques and molecular diagnostics fall into biotechnological applications which have become in recent decades fundamental tools in all knowledge of living things, from the management of the simplest microorganism to more complex medical applications.

In the field of forest resources, knowledge and use of molecular techniques are particularly valuable: typing and genetic resources certification, control and diagnosis of pests and diseases, traceability of products, environmental monitoring of invasive species, are some of the many potential applications of these techniques.

Knowledge of these new technologies is essential from the professional point of view, and the acquisition of the skills and abilities related to this techniques are completely essential for a scientific research career.

1.2 Relation to other courses

This course has special relation with basic courses like Forest Biology and Botany and to other more specific courses like Conservation and Breeding of Genetic Resources; Forest Pests and diseases; Integrate Management of Pests and Diseases…

1.3 Previous knowledge requested

Advises:

To have overcome all courses from the Basic Module and the following ones: Forest Botany, Zoology, Pests & Diseases.

2. Competences

2.1 General

All general competences (G1 to G27) will be fulfilled.

More specifically, in this course, competences G3, G5 and G156 will be assessed. G3: To be able to analyze and synthesize. G5: To be able to communicate orally and writing as well in specialized meetings and with non-specialized people. G15: To show critic reasoning.

2.2 Specific

To understand the basis of the available molecular and genetic techniques to identify organisms as MFR , pathogens and pests …etc.

To know the ways of application of these techniques to manage sanitary problems in forests

3. Objectives

GENERAL

Knowledge:

- To become familiar with specific vocabulary
- To understand and assimilate the main concepts and principles

- To know present situation and future perspectives

- To acquire an integrate view on knowledges and applications

Abilities:

- To practice the basic skills and abilities: observation, sampling, experimentation and data analysis.

- To use scientific information resources: Books, reviews, dissemination articles…etc.

- To practice reasoning capacities and concepts relation

- To develop a clear and coherent exposition style

- To develop individual work skills like responsibility and autonomy

Attitude:

- Intellectual curiosity, critical spirit, learning pleasure and accepting knowledge challenges

- Acquire attitudes for group work like leadership, cooperation, critical and constructive discussions

- To recognize and accept knowledge limits and interdisciplinary problems, and to develop tha ability to cooperate with specialists in other domains.

- Methodological work

- Interest for Scientific Dissemination

SPECIFIC

1. To differentiate convenience for the application of the different instrumental techniques to forest problems

2. To determine the convenient molecular methods to be applied to specific phytosanitary forest problems.

3. To design application of molecular techniques specifically to either prevent or protect against damage caused by harmful biotic agents, compatible with uses and demands of present sustainable forest management

4. To understand the importance and particularities of molecular identification of organisms vs other identification methods

4. Contents

- Concepts & strategies in the use of molecular techniques in Forest Science
- Potential and operational techniques in molecular identification
- Molecular identification of pathogen organisms: hybridization, Polymerase Chain Reaction
- Uses of microsatellites and other markers based on PCR
- Application of molecular identification to avoid exotic organisms introduction
- Resistance to pests and diseases and breeding
- Biological control through hypovirulence: hypoviruses identification in chesnut canker
- Genetic Engineering

5. Teaching methods

Lectures

Lab practice

Seminars

Group work

Field practice

6. Work Plan

IN PERSON ACTIVITIES	HOURS	OTHER PERSONAL ACTIVITIES	HOURS
Theoretical Lectures	10	Study and personal work	35
Laboratory practices	20	Group work	10
Total In person	**30**	**Total other**	**45**

7. Assessment

INSTRUMENT	GLOBAL WEIGHT	OBSERVATIONS
Written exam	30%	
Lab report	40%	
Seminars	30%	

8. Final considerations

Seminars will involve an oral presentation and a written report, a copy of which will be delivered. The final grade will follow criteria defined at the beginning of the course that will be published in Moodle.

In the second and following calls, a written exam will account for the practical (70%) part of the course on the practical activities and seminars.