

Proyecto/Guía docente de la asignatura

<b>Asignatura</b>	INTEGRATED MANAGEMENT OF FOREST PESTS AND DISEASES		
<b>Materia</b>	INTEGRATED MANAGEMENT OF FOREST PESTS AND DISEASES		
<b>Módulo</b>			
<b>Titulación</b>	GRADO EN INGENIERÍA FORESTAL Y DEL MEDIO NATURAL		
<b>Plan</b>	449	<b>Código</b>	47139
<b>Periodo de impartición</b>	2º CUATRIMESTRE	<b>Tipo/Carácter</b>	OB
<b>Nivel/Ciclo</b>	GRADO	<b>Curso</b>	CUARTO
<b>Créditos ECTS</b>	3		
<b>Lengua en que se imparte</b>	INGLÉS		
<b>Profesor/es responsable/s</b>	Julio Javier Diez Casero; Jorge Martín García		
<b>Datos de contacto (E-mail, teléfono...)</b>	<a href="mailto:jdcasero@pvs.uva.es">jdcasero@pvs.uva.es</a> ; ext 8420 despacho e-204 <a href="mailto:jorgemg@pvs.uva.es">jorgemg@pvs.uva.es</a> ; ext 8425 despacho e-209		
<b>Horario de tutorías</b>	Ver tutorías > <a href="http://www5.uva.es/etsiiaa/">http://www5.uva.es/etsiiaa/</a>		
<b>Departamento</b>	PRODUCCIÓN VEGETAL Y RECURSOS FORESTALES		

## **1. Situación / Sentido de la Asignatura**

---

### **1.1 Contextualización**

---

The forest stands represent some of the most valuable ecosystems for our societies, seeking primary resources, mitigating the impact of climate change, preserving habitats and harboring great biodiversity, many forest systems have been subject to various biotic and abiotic threats that put their evolution at risk and survival. Unfortunately, even more serious threats have been added to these common problems, derived from climate change and, especially, from the introduction of invasive alien species. They behave extremely destructively. To deal with all these problems, old and new, forest health requires the integrated application of tools and methods that minimize the damage caused by these with the least possible alteration of the forest ecosystems, promoting the natural mechanisms of pest control. The Integrated Pest and Disease Management course, it is proposed that the student knows what are the means and methods currently available to apply the integrated management of problems, of native and foreign origin, of forest health in our masses.

### **1.2 Relación con otras materias**

---

The integrated management of pests and diseases I intends for the student to become familiar with all forest health methods available and its subsequent integration to avoid population development of harmful biotic agents and achieve mass development vigorous and healthy forestry forests, reducing the use of phytosanitary products and promoting natural pest control mechanisms, considering their economic and ecological justification and trying to minimize the risks to human health and the environment. This subject It is therefore closely related to the compulsory subject of the Engineering Degree Forest and Natural Environment, Forest Pests and Diseases (3rd year), in which the student will be trained to identify or diagnose the agents causing phytosanitary problems, as well as it will be introduced to the methods and techniques of phytosanitary management. In the subject Management

Integrated of Forest Pests and Diseases the student will deepen in all relative aspects to the tactics and strategies currently operational or potential for the sustainable management of these problems. The subject of Integrated Pest and Disease Management II (4th Grade in Forest and Natural Environment Engineer) is conceived as a practical extension of the Integrated Management subject, in which the student will deepen the practical application of the knowledge acquired in particular and currently relevant cases of phytosanitary management forest

In the optional subject of Forest Health Management (2nd Master Forestry Engineer) the The student will have the opportunity to know the context, the legislative, organizational and methodological, within which forest health is currently being managed. In a smaller way, the subject is also related to the subjects that treat the interactions biological, ecological and genetic that are established between organisms in such complex systems like foresters. In addition, integrated forest health management is

part of the global forest management, and therefore is also linked to the subjects that address management forestry in its different aspects.

### 1.3 Prerrequisitos

---

## 2. Competencias

### 2.1 Generales

- G1 Know the basic elements of professional practice
- G2 Know and apply knowledge in practice
- G3 Be able to analyze and synthesize
- G4 Be able to organize and plan
- G5 Being able to communicate orally and in writing, both in specialized forums and for non-experts
- G6 Speaking, reading and writing in a foreign language (English)
- G7 Possess knowledge, skills and abilities of computer science and information and communication technologies (ICT)
- G8 Manage information
- G9 Being able to solve problems
- G10 Being able to make decisions
- G11 Know the academic and administrative organization of the University
- G12 Work as a team
- G13 Being able to work in a local, regional, national or international context
- G14 Develop interpersonal relationships
- G15 Demonstrate critical reasoning
- G16 Have an ethical commitment
- G17 Learn autonomously both individually and cooperatively
- G18 Adapt to new situations
- G19 Develop creativity.
- G20 Being able to lead
- G21 Recognize and appreciate other cultures and customs as well as diversity and multiculturalism
- G22 Be able to take initiatives and develop entrepreneurial spirit
- G23 Have motivation for quality
- G24 Commit to environmental issues
- G25 Commit to sex equality, both in work and personal settings, use of non-sexist or racist language
- G26 Commit to equal rights of persons with disabilities
- G27 Commit to a culture of peace

### 2.2 Específicas

Facilitate the student's knowledge of integrated phytosanitary management strategies and methods, to minimize damage caused by harmful biotic agents with the least alteration of forest systems Empower the student to apply the techniques for the prevention and reduction of problems forest phytosanitary products indicated in the guidelines for integrated pest management in forest stands. Train the student for advice on integrated pest management.

### 3. Objetivos

- . Know the different phytosanitary management strategies and the principles that make up the integrated management of Forest pests and diseases.
- . Determine the appropriate sustainable methods of integrated management to solve the specific problems of forest phytosanity
- . Design the application of specific techniques for prevention and protection against damage caused by harmful biotic and abiotic agents, compatible with the sustainable uses and demands of management current forest

### 4. Tabla de dedicación del estudiante a la asignatura

ACTIVIDADES PRESENCIALES	HORAS	ACTIVIDADES NO PRESENCIALES	HORAS
Clases teóricas	10	Estudio y trabajo autónomo individual	35
Clases prácticas	10	Estudio y trabajo autónomo grupal	10
Laboratorios	6		
Prácticas externas o de campo	2		
Seminarios	2		
Otras actividades			
<b>Total presencial</b>	<b>30</b>	<b>Total no presencial</b>	<b>45</b>

## 5. BLOQUES TEMÁTICOS

### BLOQUE I: UNIDAD DIDÁCTICA 1.:

#### Objetivos:

- Descritos en apartado 3.

#### Contenidos:

1. *Introduction to integrated pest management: general principles and management guides*
- 2. *Monitoring and prevention of forest pests*
- 3. *Forest management of forest pests and diseases*
- 4. *Case Studies of Integrated management of forest pests:*
  - a. *Bark beetles*
  - b. *Pine wood nematode*
  - c. *Leptoglossus occidentalis*
- 5. *Case Studies of Integrated management of forest diseases*
  - a. *Foliar Diseases: Dothistroma ssp / Lecanostica acicola*
  - b. *Trunk and branches diseases:*
    - b1. *Fusarium circinatum*
    - b2. *Cryphonectria canker*
- c. *Root diseases: Phytophthora spp.*

#### Métodos y material docente:

- Theoretical classes
- Practical classes
- Scientific discussion in seminars

#### Plan de trabajo

Face-to-face hours:

- . Theory: 10 hours
- . Practices (Classroom, laboratory): 16 hours
- . Seminars and exhibitions: 4 hours

Temporalización (Por bloques temáticos)

BLOQUE TEMÁTICO DESARROLLO	CARGA ECTS	PERIODO
MANEJO INTEGRADO DE PLAGAS Y ENFERMEDADES Semanas 16-30	3	

## 6. Evaluación

The student's grade will be obtained in an oral test where the student must demonstrate competencies related to understanding, analysis, knowledge expression and the application of action techniques and problem solving. This test will consist of the presentation of a work on the management of a previously assigned pest or disease. The evaluation will be completed taking into account the attendance to the theoretical and practical classes (minimum 70%), as well as their active participation in the questions,

discussions and debates generated during the class and the seminars.

### **Bibliografía:**

- BELLOWS T.S, MEISAENBACHER C., Y REARDON R.C. (Eds). 1998. Biological control of arthropods of the Western United States: A Review and recommendations. USDA Forest Health Technology Team, FHTET-96-21, Morgantown WV.
- BENITEZ, T., RINCON, A.M., LIMON, M.C. & CODON, A.C. 2004. Biocontrol mechanisms of *Trichoderma* strains. *International Microbiology* 7(4): 249–260.
- BERRYMAN A. A. (ed.) (2002). Population cycles: evidence for trophic interactions. Oxford.
- CAMPANILE, G., RUSCELLI, A. & LUISI, N. 2007. Antagonistic activity of endophytic fungi towards *Diplodia corticola* assessed by in vitro and in planta tests. *European Journal of Plant Pathology* 117(3): 237–246.
- CAPIEAU, K., STENLID, J. & STENSTROM, E. 2004. Potential for biological control of *Botrytis cinerea* in *Pinus sylvestris* seedlings. *Scandinavian Journal of Forest Research* 19(4): 312–319.
- CARDÉ R.T., MINKS A.K. (eds). (1997). Insect pheromone research. New directions. Chapman & Hall.
- DELLINGER T.A., FIDGEN J.G. Y SALOM S.M. 2010. Sampling methods for forest and shade tree insects of North America. Vol 2. USDA Forest Health Technology Team, FHTET-2010-03, Morgantown WV.
- FETTIG C.J., FIDGEN J.G., MCCLELLAN Q, Y SALOM SM. 2010. Sampling methods for forest and shade tree insects of North America. Vol 1. USDA Forest Health Technology Team, FHTET-2001- 01, Morgantown WV.
- JERVIS M. (1996). Insect natural enemies. Practical approaches to their study and evaluation. Chapman & Hall.
- KABALUK J.T., SVIRCEV A.M., GOETTEL M.S. Y WOO S. G. (EDS). 2010. The Use and LIEUTIER F., DAY K., BATTISTI A., GREGOIRE J.C. AND EVANS HF (eds). 2004. Bark and Wood Boring Insects in Living Trees in Europe, a Synthesis. Kluwer Academic Publishers, Dordrecht.
- MUÑOZ C., PÉREZ V., COBOS P., HERNÁNDEZ R., SÁNCHEZ G. 2003 .Sanidad forestal. Guía en imágenes de plagas, enfermedades y otros agentes presentes en los bosques. Mundi Prensa, Madrid.
- PÉREZ, G.; DÍEZ J.J.; IBEAS, F.; PAJARES, J.A. (2008). Modelling Pine Wilt Disease Risk under a climate change scenario in North Western Spain. 269-282. En: Managing forest ecosystems: the challenge of climate change (Bravo F., LeMay V. and V Gadaw K, eds.) Kluger Academic Publishers.
- PHILLIPS, DR., BURDEKIN, DA. 1982. Diseases of Forest and Ornamental trees. Mc Millan. London. Regulation of Microbial Pesticides in Representative Jurisdictions Worldwide. IOBC Global. Available online through [www.IOBC-Global.org](http://www.IOBC-Global.org)
- RIDWAY R. L., SILVERSTEIN R.M., INSCOE M.N. (eds.) (1990). Behavior.modifying chemicals for insect management. Aplications of pheromones and other attractants. Marcel Dekker.
- SMITH ET AL 1992. Manual de enfermedades de las plantas. Mundi-Prensa, Madrid.
- TATTAR T. 1989. Diseases of shade trees. Academic Press, New York.