



IDENTIFYING DATA

Pathology and forest pests

Subject	Pathology and forest pests			
Code	P03G370V01703			
Study programme	Grado en Ingeniería Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Galician			
Department				
Coordinator	López de Silanes Vázquez, María Eugenia			
Lecturers	López de Silanes Vázquez, María Eugenia			
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General description	(*)Comprender e aprender os conceptos básicos e a terminoloxía específica, para coñecer e diferenciar as enfermidades e pragas máis importantes, resaltando as que afectan ao ámbito forestal do noso territorio			

Training and Learning Results

Code	
B1	Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area.
B3	Knowledge of degradation processes that affect forest systems and resources (pollution, pests and diseases, fires, etc.) and capacity for the use of forest environment protection techniques, forest hydrological restoration and biodiversity conservation .
C34	Ability to know, understand and use the principles of: forest diseases and pests.
D4	Sustainability and environmental commitment
D7	Skill in the use of IT tools and ICTs.
D8	Ability to solve problems, critical reasoning and decision making

Expected results from this subject

Expected results from this subject	Training and Learning Results
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2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.	B1	C34	D4
3R. 2018 Be conscious of the multidisciplinary context of the engineering.			D7
4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.			D8
5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.			
6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.			
7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.			
8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.			
9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.			
10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study.			
11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.			
13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.			
14R. 2018 Capacity to apply norms of engineering in the his speciality.			
15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering.			
17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions			
20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines.			
21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life.			
22R. 2018 Capacity to be to the day of the scientific and technological news.			

Contents

Topic

Topic 1. Concept of Disease and Phytopathology.

Classification of diseases.

Topic 2. Symptomatology of diseases. Types of symptoms.

Topic 3. Concept of pathogen and parasite.

Stages of disease development.

Topic 4. Types of attacks from pathogens to plants.

Topic 5. How plants are defended by pathogens.

Topic 6. Means of control against pathogens: preventive and curative. Control methods: regulators (legislative), cultural, biological, physical and chemical.

Topic 7. Generalities of fungi. Important groups in Forest Pathology.

Topic 8. Rotting, drowning or damping-off in seedbeds.

Topic 9. Diseases of leaves in conifers

9.1 Red band (*Mycosphaerella pini* and *M. dearnessii*)

9.2 Blight of pine needles (*Lophodermium pinastri*).

9.3 Mention of *Meloderma desmazieri*

Topic 10. Diseases of leaves in angiosperms

10.1 Oidium or odium of the oak, *Erysiphe alphitoides*.

10.2 Spotting of eucalyptus leaves, *Mycosphaerella* sp.

10.3 Gray mold, *Botryotinia fuckeliana* = *Botrytis cinerea*

Topic 11. Diseases of trunk and branches of conifers.

11.1 Cancers: *Sphaerosopsis sapinea* = *Granulodiplodia sapinea*; *Nectria cinnabarina* = *Tubercularia vulgaris*.

11.2 Royas: *Cronartium flaccidum* or white rust of pine.

11.3 Resinous pineal cancer *Gibberella circinata* = *Fusarium circinatum*.

Topic 12. Diseases of trunk and branches in Angiosperms.	12.1 Chestnut brown, <i>Cryphonectria parasitica</i> . 12.2 Carbon or carbonaceous disease, <i>Biscogniauxia mediterranea</i> = <i>Hypoxylon mediterraneum</i> . 12.3 Grafiosis of elm. <i>Ophiostoma ulmi</i> , <i>O. novo-ulmi</i>
Topic 13. Root diseases.	13.1 Chestnut ink, <i>Phytophthora cinnamomi</i> . 13.2 In conifers, <i>Heterobasidion annosum</i> . 13.3 Pathogen of numerous species. <i>Armillaria</i> sp.
Topic 14. Diseases caused by nematode viruses and bacteria.	14.1 Pine wood nematode, <i>Bursaphelenchus xylophilus</i>
Topic 15. General ideas about insects. Classification: Apterygota. Exopterygota. Endopterygota.	
Topic 16. Biological balance and plague phenomenon.	
Topic 17. Methods of pest control.	
Topic 18. Conifer pests	18.1 Defoliator insects: <i>Thaumetopoea pityocampa</i> . 18.2 Insect borers, most representative species: scythes (<i>Ips sexdentatus</i>) cerambícidos (<i>Monochamus galloprovincialis</i>), etc. 18.3 Most representative taxa of sucking insects.
Topic 19. Eucalyptus pests.	19.1 Deflating insects, <i>Gonipterus scutellatus</i> 19.2 Insect borers, <i>Phoracantha semipunctata</i> . 19.3 Sucking insects, <i>Ctenarytaina spatulata</i>
Topic 20. Review some of the most representative pests of garden trees. Mention of the plagues of the chestnut fruit.	
(*) Tema 21. Mención de algunhas pragas en frondosas autoctonas.	(*)21.1 Insectos defoliadores 21.2 Insectos perforadores 21.3 Insectos chupadores
(*)Práctica 1. Como elaborar medios de cultivo de hongos	
(*)Práctica 2. Identificación de estruturas reproductoras de hongos	
(*)Práctica 3. Aprender a metodoloxía do repicaxe de hongos, en placas Petri e tubos roscados	
(*)Práctica 4. Illar hongos a partir de material vexetal.	
(*)Páctica 5. Recoñecer os síntomas e signos das enfermidades e pragas forestais máis frecuentes, tanto no laboratorio como no campo.	
(*)Páctica 6. Recoñecer as enfermidades e pragas máis importantes nos cultivos forestais e bosques	
(*)Práctica 7. Se é posible se visitará a Estación Fitopatolóxica do Areeiro. Centro de referencia en patoloxía e pragas.	

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	30	70	100
Laboratory practical	20	10	30
Mentored work	2	18	20

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Lecturing	Exposition, by the teacher, of the contents of the subject, theoretical bases and / or guidelines of a work to be developed by the students
Laboratory practical	Application of the knowledge of the subject. Learning and handling of basic techniques.
Mentored work	Realization of exits to forest ecosystems and / or visits to research centers or companies related to the subject studied.

Personalized assistance

Methodologies	Description
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Laboratory practical	Students will be guided to choose the right literature for the full or to make their own subjects. To help solve problems and concerns that students encounter in laboratories.
Lecturing	Provide tools they need to solve for themselves the question to appear after they have studied the topics dealt with in the opening sessions in the tutoring hours practices. In, indicate the appropriate literature so that they can resolve the question doubts.
Mentored work	

Assessment

	Description	Qualification	Training and Learning Results		
Lecturing	Written exam.- Students must answer different questions to demonstrate their knowledge of theoretical concepts and practical questions of the subject. It will consist of short answer questions and long answer questions. Presentation by the students of one of the topics of the program.	40	B1	C34	D4
Laboratory practical	Continuous evaluation of the activities developed in the practices, as well as the memory and / or exam that students must take at the end of the course	40		C34	D4
Mentored work	(*)Exposición por parte do alumnado dun dos temas do programa ou tema libre relacionado coa asignatura. Antes da exposición, entregará un resumo do mesmo. O resumo debe ceñirse as normas publicadas no moovi.	20	B3		D7 D8

Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

- AGRIOS, G.N., **Plant pathology**., 5ª Ed. Elsevier Academic Press,
- ANDRÉS, M. FE DE, **Patógenos de plantas descritos en España**., Ministerio de Agricultura, Pesca y Alimentación,,
- BARBAGALLO S., CRAVEDI P., PASQUELINI E. & PATTI I., **Pulgonos de los principales cultivos frutales**, Bayer/Mundi-Prensa,
- CARRERO, J.M., **Lucha integrada contra las plagas agrícolas y forestales**, Mundi-Prensa.,
- DAJOZ R., **Entomología forestal. Los insectos y el bosque: papel y diversidad de los insectos en el medio foresta**, Mundi-Prensa,
- JARVIS W.R., **Control de las enfermedades en cultivos de invernadero**, Mundi-Prensa,
- LIÑÁN, C., **Vademecum de productos fitosanitarios y nutricionales**., Mundi Prensa,
- Lombardero M.J. & Fernández de Ana F.J., **A Procesionaria do piñeiro en Galicia**., Consellería de Agricultura, Gandería e Montes., Xunta de Galicia,
- MALLOY O.C. & MURRAY T.D. (eds), **Encyclopedia of plant pathology**, New York, [etc.] : John Wiley,
- Mansilla J.P., Pérez R., Pintos C., Salinero C. & Iglesias C., **Plagas y enfermedades del castaño en Galicia**, 2ª ed. Xunta de Galicia. Consellería de Agricultura, Ganadería e Política Agroalimentaria.,
- MUÑOZ LÓPEZ C., PÉREZ FÓRTEA V., COBOS SUÁREZ P., HERNÁNDEZ ALONSO R., SÁNCHEZ PEÑA G., **Sanidad forestal: guía en imágenes de plagas, enfermedades y otros agentes presentes en los montes**, Mundi-Prensa 3ª ed,
- ROMANYK, N. & CADAHIA, D., **Plagas de insectos en las masas forestales**, Mundi-Prensa,
- TAINTER, F.H. & BAKER, F.A., **Principles of forest pathology**, John Wiley & Sons,
- TORRES JUAN, J., **Patología Forestal.Principales enfermedades de nuestras especies forestales**, Mundi Prensa.,
- VILLALVA, S., **Plagas y enfermedades de jardines**, 2ª Ed. Mundi-Prensa,
- <http://www.infoagro.com/agrovademecum/>, **Agrovademecum**,
- Robert N. Trigiano, Mark T. Windham, Alan S. Windham (Eds.), **Plant pathology concepts and laboratory exercises**, Boca Raton (Florida): CRC,,
- Molina G., Zaldúa S., González G., Sanfuentes E., **Selección de hongos antagonistas para el control biológico de Botrytis cinerea en viveros forestales en Chile**, Bosque 27(2): 126-134., 2006
- Remacha-Gete, A., **Agentes Bioticos que atacan la madera. Ciclo biológico, tipo de ataque y control del mismo**, AlTiM. Madrid,
- Otero L., Aguin O., M. J. Sainz M.J., Mansilla J.P., **El género Mycosphaerella en plantaciones de Eucalyptus en G Galicia**, Bol. San. Veg. Plagas, 33: 503-516, 2007
- <http://www.efa-dip.org/es/Publicaciones/FTecnicas/FichaListaTIPO.htm>, **Índice de Fichas Técnicas disponibles en la Estación Fitopatológica**, Diputación de Pontevedra,
- ZÚBRIK M., KUNCA A. & CSÓKA G. (Eds.), **Insects and Diseases damaging trees and shrubs of Europe**, NAP Editions, 2013

Recommendations

Subjects that it is recommended to have taken before

Biology: Plant Biology/P03G370V01201
Botany/P03G370V01303
Forestry Ecology/P03G370V01402
Forestry/P03G370V01401
Forest entomology and Zoology/P03G370V01305
