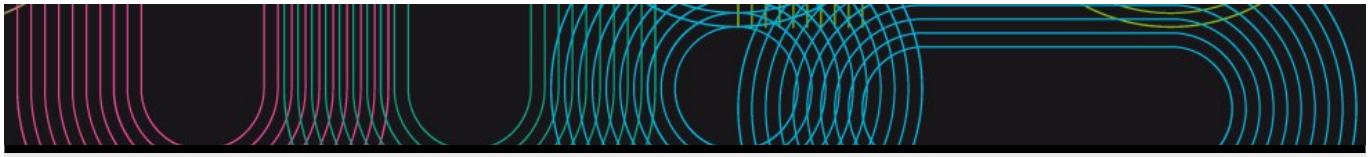

IDENTIFYING DATA				
Pathology and forest pests				
Subject	Pathology and forest pests			
Code	P03G370V01703			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish Galician			
Department				
Coordinator	López de Silanes Vázquez, María Eugenia			
Lecturers	López de Silanes Vázquez, María Eugenia			
E-mail	esilanes@uvigo.es			
Web	http://http://webs.uvigo/esilanes/index.htm			
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			

Competencies	
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

Learning outcomes	
Expected results from this subject	Training and Learning Results

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 B3	C34	D4 D7 D8
3R. 2018 Be conscious of the multidisciplinary context of the engineering.			
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.			
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: Sphaerospsis 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, Cryphonectria parasitica. 12.2 Carbon or carbonaceous disease, Biscogniauxia mediterranea = Hypoxylon mediterraneum. 12.3 Grafiosis of elm. Ophiostoma ulmi, O. novo-ulmi
Topic 13. Root diseases.	13.1 Chestnut ink, Phytophthora cinnamomi. 13.2 In conifers, Heterobasidion annosum. 13.3 Pathogen of numerous species. Armillaria sp.
Topic 14. Diseases caused by nematode viruses and bacteria.	14.1 Pine wood nematode, Bursaphelenchus xylophilus
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: Thaumetopoea pityocampa. 18.2 Insect borers, most representative species: scythes (Ips sexdentatus) cerambícidos (Monochamus galloprovincialis), etc. 18.3 Most representative taxa of sucking insects.
Topic 19. Eucalyptus pests.	19.1 Deflating insects, Gonipterus scutellatus 19.2 Insect borers, Phoracantha semipunctata. 19.3 Sucking insects, Ctenarytaina spatulata
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

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	30	70	100
Laboratory practical	20	20	40
Studies excursion	10	0	10
*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.
Studies excursion	Realization of exits to forest ecosystems and / or visits to research centers or companies related to the subject studied.

Personalized assistance

Methodologies	Description
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.

Assessment

	Description	Qualification	Training and Learning Results
Lecturing	(*)Exame escrito.- O alumnado debe responder a diferentes cuestións para demostrar os seus coñecementos sobre conceptos teóricos e cuestións prácticas da materia. Constará de preguntas de reposta curta e outras de resposta longa. Exposición por parte do alumnado dun dos temas do programa.	70	B1 C34

Laboratory practical	(*)Avaliación continua das actividades desenvolvidas nas prácticas, así como da memoria ou entrega de exemplares de patoloxía de plantas e/ou un exame práctico que o alumnado deben realizar ao final do curso.	30	C34

Other comments on the Evaluation

Exam dates

First Call: January 10, 2020, 10:00 Hours

Second Call: June 25, 2020 12:00 Hours

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., **Pulgones 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,

MALOY 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 FORTEA 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**, http://www.scielo.cl/pdf/bosque/v27n2/art07.pdf, Bosque 27(2): 126-134., 2006

Remacha-Gete, A., **Agentes Bioticos que atacan la madera. Ciclo biológico, tipo de ataque y control del mismo**, AITiM. Madrid,

Otero L., Aguín O., M. J. Sainz M.J., Mansilla J.P., **El género Mycosphaerella en plantaciones de Eucalyptus en Galcia**, www.magrama.es/ministerio/pags/biblioteca/revistas/pdf_Plagas/BSVP_33_04_503_516.pdf, 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

Contingency plan

Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified

* Non-attendance mechanisms for student attention (tutoring)

* Modifications (if applicable) of the contents

* Additional bibliography to facilitate self-learning

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Pending tests that are maintained
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Tests that are modified
[Previous test] => [New test]

* New tests

* Additional Information