



(*)Escola de Enxeñaría Forestal

Presentation

Welcome to the Forestry Faculty (Campus of Pontevedra - University of Vigo). Details information about our faculty can be found in <http://www.forestales.uvigo.es>

Our faculty offers the Degree in Forest Engineering

The Degree comprises 240 credits ECTS during four years, meaning an annual distribution of 60 ECTS distributed in 30 ECTS per semester.

Address

1. Name: Forestry Technical School
2. Degree: Degree in Forestry
3. Postal address: Campus A Xunqueira, 36005 Pontevedra
4. Telephone: 986-801900
5. FAX: 986-801907
6. And-mail: sdeuetf@uvigo.es
7. Web: <http://www.forestales.uvigo.es>

Faculty Management

Managerial team:

Director: D. Juan Picos Martín

Deputy director: D^a. Angeles Cancela Carral

Secretary: D. José Manuel Casas Mirás

Governing bodies:

- Faculty Assembly

- Commissions:

- Permanent
- Economic Affairs
- Academic Affairs
- Credit Validation
- Quality

Departments in the Centre:

Department of Engineering of the Natural Resources and Environment (<http://dir.uvigo.es>)

Servizo e Infraestructuras do Centro

1. Administración: o horario de atención ao público de secretaría é de 9:00 a 14:00 horas.
2. Bibliotecas: http://www.uvigo.es/uvigo_gl/Administracion/Biblioteca/directorio/campus_pontevedra.html
3. Conserxaría: A conserxaría do Centro permanece aberta desde a apertura ao peche do Centro, en dúas quendas: 8:00 a 15:00 horas, e 15:00 a 22:00.
4. Reprografía: Este servizo atópase na Facultade de CC. Sociais e cobre as necesidades do Campus.
5. Cafetería
6. Administrador de Centros
7. Área de Servizos á Comunidade
8. Rexistro
9. LERD
10. Bolsas
11. CAP
12. OSIX

Aulas e laboratorios:

Aulas docentes:

AULA	Nº DE POSTOS TOTAIS	Nº DE POSTOS EN DISPOSICIÓN DE EXAME
1	65	35
2	65	35
3	65	35
4	98	53
5	104	56
6	104	56
7	104	56
8	104	56
9	104	56
SUMA	813	438

Laboratorios e talleres:

ANDAR	LABORATORIO	DOCENTE		INVEST.	
		Superficie	Capacidad Persoas	Superficie	Capac. Persoas
Soto	Lab. Hidráulica e Hidroloxía Forestal	115, 83 m ²	16	35,67 m ²	3
Soto	Lab. Enxeñería Mecánica /Lab. Termotecnia	110, 17 m ²	16	NO	No
Soto	Celulosa Pasta e Papel	72,04 m ²	15	35,67 m ²	3
Soto	Taller Enerxías Xiloxeneneradas	171,51 m ²	25	2º Andar	2º Andar
Soto	Taller de Madeiras	342,11m ²	35	NO	NO
P.Baixa	Aula Informática (1)	108,85 m ²	24	NO	
P.Baixa	Aula Informática (2)	107,34 m ²	24	NO	
P.Baixa	Expresión Gráfica	168,45 m ²	48	NO	
P.Baixa	Proxectos	95,00 m ²		6	
1º	Lab. Física	112,54 m ²	16	35,67 m ²	4
1º	Lab. Ecoloxía	109,41 m ²	30	36,61 m ²	4
1º	Lab. Enxeñería do Medio Ambiente	NO	NO	34,54 m ²	4
1º	Lab. Topografía	117,57 m ²	40	36,75 m ²	2
1º	Lab. Edafoloxía	109,98 m ²	16	27,40 m ²	7
2º	Lab. Silvicultura e Repoboación	109,60 m ²	16		
2º	Lab. Enerxías Xiloxeneneradas	Soto	Soto	36,61 m ²	4
2º	Lab. Incendios Forestais	112,11 m ²	17	34,54 m ²	5
2º	Lab. Producción Vexetal	117,57 m ²	24	36,75 m ²	4
2º	Lab. de Acuicultura	112,54 m ²	pendente	NO	NO
2º	Lab. Enxeñería Eléctrica	110,73 m ²	21	NO	NO
2º	Lab. Enxeñería Química	109,98 m ²	15	27,40 m ²	6

Additional information

STUDENTS OFFICE:

Number tfno.: 986 801913

And-mail: daeuetf@uvigo.es

Main Regulations

Rules of interest for the students; we indicate the links where the student can find information of his interest:

Specific rules of the University of Vigo: www.uvigo.es

http://www.uvigo.es/uvigo_gl/administración/servicioalumnado

<http://extension.uvigo.es>

http://webs.uvigo.es/vicoap/normativa_oa.gl.htm

http://www.uvigo.es/uvigo_gl/estudiostitulaciones

http://www.uvigo.es/uvigo_gl/vidauniversitaria/calendarioescolar

http://www.uvigo.es/uvigo_gl/vidauniversitaria/universidadvirtual

http://secxeral.uvigo.es/secxeral_gl/normativa/normativauniversidad/estudaintes/reglamento_estudiantes.html

http://www.uvigo.es/uvigo_gl/vidauniversitaria/normativa

<http://www.forestales.uvigo.es>

Other Information

- **Study Plan:** <http://www.forestales.uvigo.es>
- **Scholarships:** <http://193.146.32.123:8080/GestorBecas/user/Becas.do?accion=tiposList>
- **Medical assistance:** http://www.uvigo.es/uvigo_gl/vidauniversitaria/salud/centromedico/
- **Employment Office :** <http://emplego.uvigo.es/>
- **Canteens and accommodation:** http://www.uvigo.es/uvigo_gl/vidauniversitaria/comedores_aloxamento/
- **Other activities:**
 - http://www.campuspontevedra.uvigo.es/index.php?*id=14 (Sports in the Campus of Pontevedra)
 - <http://deportes.uvigo.es/index.asp> (Sport Services).
 - <http://extension.uvigo.es/>

Grado en Ingeniería Forestal

Subjects

Year 4th

Code	Name	Quadmester	Total Cr.
P03G370V01701	Physical planning and land management	1st	6
P03G370V01702	Hunting and fishing management	1st	6

P03G370V01703	Pathology and forest pests	1st	6
P03G370V01704	Forest and pasture management	1st	6
P03G370V01705	Wood preservation and drying technology	1st	6
P03G370V01706	Primary wood processing industries	1st	6
P03G370V01707	Industrial organisation and processes in the wood industry	1st	6
P03G370V01708	Product development and innovation in the wood industry	1st	6
P03G370V01709	Innovation and development of products in the forest industry	1st	6
P03G370V01801	Management of protected areas and biodiversity	2nd	6
P03G370V01802	Forest Fires	2nd	6
P03G370V01803	Cellulose, pulp and paper	2nd	6
P03G370V01804	Quality control and prevention of occupational hazards in the forestry industry	2nd	6
P03G370V01805	Chemical industries of the wood, cellulose, pulp and paper	2nd	6
P03G370V01981	Internships: Internships	An	6
P03G370V01991	Final Year Dissertation	2nd	12

IDENTIFYING DATA**Physical planning and land management**

Subject	Physical planning and land management			
Code	P03G370V01701			
Study programme	Grado en Ingeniería Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish Galician			
Department				
Coordinator	Fernández Alonso, José María			
Lecturers	Fernández Alonso, José María Rodríguez Somoza, Juan Luis			
E-mail	josemfernandez@uvigo.es			
Web				
General description				

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.
B2	Ability to analyze the ecological structure and function of forest systems and resources, including landscapes.
B10	Ability to apply the techniques of forest management and land planning, as well as the criteria and indicators of sustainable forest management within the framework of forest certification procedures.
C32	Ability to know, understand and use the principles of: planning and planning of the territory. Forest landscaping.
D4	Sustainability and environmental commitment
D5	Capacity for information management, analysis and synthesis
D6	Organization and planning capacity
D7	Skill in the use of IT tools and ICTs.
D8	Ability to solve problems, critical reasoning and decision making
D9	Teamwork skills, skills in interpersonal relationships and leadership.
D10	Autonomous Learning

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 B2 B10	C32	D4 D5 D6 D7 D8 D9 D10
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.			
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.			
11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.			
12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop 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.			
16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context.			
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			
18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions.			
19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general.			
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 I: GENERAL THEORY OF PLAN. PHYSICS	Concept of Physical Planning. Physical Planning in Engineering Background of Physical Planning Environmental and integrated inventories Evolution of Physical Planning studies Definitions of Physical Planning Ecologically based physical planning
Topic II: PHYSICAL PLANNING PROCESS	Typology and Purposes of Planning Operational techniques Levels of application Fundamental relationships General scheme Definition of objectives Inventory Modeling Spatial classification Choice of Alternatives Decision making Contrast of Planning Planning follow-up
Topic III: THE TOOLS FOR PHYSICAL PLANNING	Introduction to Geographic Information Systems. The S.I.G. Applied to Physical Planning and Territorial Planning.

Planning

	Class hours	Hours outside the classroom	Total hours
Mentored work	0	30	30
Presentation	25	30	55
Case studies	21	23	44
Objective questions exam	1	0	1
Essay	0	20	20

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

Methodologies

	Description
Mentored work	The student, individually or in groups, prepares a paper on the subject of matter or prepare seminars, research, memoirs, essays, summaries of readings, lectures, etc.. Generally it is an autonomous activity / of the student / s that includes finding and collecting information, reading and literature management, writing ...
Presentation	Exhibition by the students to the teacher and / or a group of students of a subject matter or content of the results of a job, exercise, project ... It can be done individually or in groups.
Case studies	Analysis of an event, issue or actual event in order to know, interpret, solve, generate hypotheses, comparing data, reflect, complete knowledge, diagnose and training in alternative dispute resolution procedures.

Personalized assistance

Methodologies Description

Mentored work	Tutoring sessions will be given to students for the correct development of the final work of the subject
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Assessment

	Description	Qualification	Training and Learning Results
Mentored work	The student by himself alone or in groups of two people will owe to elaborate and draft a technical preliminary draft, what will constitute the central axis of the subject, in function of the knowledges that go purchasing in the theoretical classes. This work will have character semiprofesional and preferably will be made on a real case.	40	
Presentation	It will constitute the initial development of the subject, not to limiting to mere exhibitions by part of the professor, but doing them to participate as well as one tests/examination at the end	40	
Case studies	(*).	20	

Other comments on the Evaluation

The official dates and possible changes are displayed on the official EE Forestal board and on the website <http://forestales.uvigo.es/gl/>

Those students who renounce the continuous assessment must submit to a specific additional test

Sources of information

Basic Bibliography

Complementary Bibliography

Recommendations

IDENTIFYING DATA				
Hunting and fishing management				
Subject	Hunting and fishing management			
Code	P03G370V01702			
Study programme	Grado en Ingeniería Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish Galician			
Department				
Coordinator	Valero Gutiérrez del Olmo, Enrique María			
Lecturers	Caballero Javierre, Pablo Valero Gutiérrez del Olmo, Enrique María			
E-mail	evalero@uvigo.gal			
Web	http://http://faitic.uvigo.es/index.php/es/			
General description	(*)Preténdese que o alumno adquira os coñecementos necesarios para a realización de Inventarios poboacionais, redacción de proxectos de xestión da caza e da pesca, avaliación e medidas correctoras dos hábitats e para a realización de repoboacións cinexéticos e piscícolas			

Training and Learning Results	
Code	
B8	Ability to manage and protect forest fauna populations, with special emphasis on hunting and fish populations.
C33	Ability to know, understand and use the principles of: hunting and fishing management. Aquaculture systems.
D4	Sustainability and environmental commitment
D5	Capacity for information management, analysis and synthesis
D6	Organization and planning capacity
D8	Ability to solve problems, critical reasoning and decision making

Expected results from this subject	
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.	B8	C33	D4
3R. 2018 Be conscious of the multidisciplinary context of the engineering.			D5
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.			D6
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.			D8
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.			
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.			
16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context.			
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			
18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions.			
19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general.			
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.			

Contents

Topic

BLOCK I: HUNTING AND KINETIC RESOURCES	MODULE I: BASIC CONCEPTS OF CINEGÉTICAL MANAGEMENT MODULE II: TECHNIQUES FOR IMPROVING THE CONDITIONS OF REPRODUCTION AND CREATION MODULE III: IMPROVEMENT TECHNIQUES COND. OF SHELTER AND FOOD MODULE IV: SUSTAINABLE APPROVAL METHODS MODULE V: HUNTING IN THE CONTEXT OF RURAL DEVELOPMENT
BLOCK 2: AQUACULTURE	MODULE I. INTRODUCTION TO AQUACULTURE IN THE FLUVIAL HABITAT: MODULE II. AQUACULTURE AND FLUVIAN FISHERIES: MODULE III. FISH SPECIES: -SMALMIDS MODULE IV. FISH SPECIES: -CYPRINESIS: MODULE V. FISH SPECIES: -MOTHER SPECIES: MODULE VI.- METHODS OF MANAGEMENT MODULE VII.- METHODS OF USE MODULE VIII.-CONTINESAL WATER MANAGEMENT PROJECTS

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	45	0	45
Studies excursion	20	10	30
Practices through ICT	10	23	33
Objective questions exam	30	0	30
Problem and/or exercise solving	2	0	2
Systematic observation	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	They will give lessons in class of the subjects of development
Studies excursion	They will organise gone out of field related with the matter, that later will be evaluated with a report of the practices made.
Practices through ICT	(*)Trabajo en plataforma e-learning

Personalized assistance	
Tests	Description
Objective questions exam	It will make a final examination

Assessment			
	Description	Qualification	Training and Learning Results
Studies excursion	(*)Diferentes preguntas sobre a materia vista nas prácticas realizadas.	20	
Practices through ICT	(*)O estudante deberá seguir o curso mediante formación a distancia, existindo unha ferramenta do sistema para coñecer a frecuencia e cadencia na que o alumno accede ao curso, e a posibilidade de dialogar a través de Internet para detectar anomalías ou resolver incidencias.	40	
Objective questions exam	Different questions on the matter seen in the sessions *magistrales as well as in the practices made.	40	

Other comments on the Evaluation

Students who withdraw the continuous evaluation will be evaluated exclusively on the practical and theoretical exam, assuming between them 100% of the final grade.

The official dates and possible changes are shown on the official EE Forestal bulletin board and on the website <http://forestales.uvigo.es/gl/>

Sources of information

Basic Bibliography

Complementary Bibliography

ARRIGNON, J., **Ecología y piscicultura de aguas dulces.**, (1979),
 BARNABE, G, **Acuicultura**, 1989,
 BEVERIDGE, M., **Acuicultura en jaulas**, 1984,
 BLANCO CACHAFEIRO, M. C, **La trucha. Cría industrial.**, 1995,
 DOADRIO, I., B. ELVIRA y. Y. BERNAT, **Peces continentales españoles. Inventario y clasificación de zonas fluviales**, 1991,
 DRUMOND, S., **Cría de la trucha**, 1988,
 ESPINOSA, J. y LABARTA, U., **Reproducción en Acuicultura.**, 1987,
 FAO, **La formulación de proyectos de acuicultura**, 1991,
 GARCÍA-BADELL, J. J, **Tecnología de las explotaciones piscícolas**, 1985,
 GARCÍA DE JALÓN, D.; G. PRIETO y F. HERRERUELA, **Peces ibéricos de agua dulce**, 1989,
 GUEGUEN, J. y PROUZET, **Le saumon atlantique**, 1994),
 HUET, M., **Tratado de piscicultura**, 1983,
 LOBÓN CERVÍ, JAVIER, **Dinámica de poblaciones de peces en ríos. Pesca eléctrica y métodos de capturas sucesivas en la estima de abundancias**, 1991,
 MUUS, B. & P. DAHLSTÖM, **Los peces de agua dulce de España y de Europa; pesca, biología, importancia económica**, 1970,
 ROBERTS, R. J, **Patología de los peces**, 1981,
 SEDWICK, S.D., **Cría de l trucha**, 1987,
 SHEPHERD, J. C. & BROMAGE, R. N., **Cultivo intensivo de peces.**, 2008,
 STREBLE, H. y D. KRAUTER, **Atlas de los Microorganismos de Agua Dulce**, 2007,
 ALVARADO CORRALES, E. et al., **Manual de Ordenación y Gestión Cinegética.**, 2001,
 SÁNCHEZ GASCÓN, A, **Guardas de Caza: Legislación**, 1996,
 AUDEBERT, Tristan (Henri Béraud), **La caza de la becada**, 1997,
 BERTON, Jean, **El mundo de las armas de caza**, 2003,
 ALBENTOS, Marqués de, **Arte general de cacerías y monterías.**, Ed. Clan, Sevilla,
 BOZA, Moisés D, **El trampeo y demás artes de caza tradicionales en la península Ibérica.**, 2003,

Recommendations

Subjects that continue the syllabus

Projects/P03G370V01503

Physical planning and land management/P03G370V01701

Subjects that are recommended to be taken simultaneously

Forestry Ecology/P03G370V01402

Use of forests/P03G370V01601

Forestry hydrology/P03G370V01604

Subjects that it is recommended to have taken before

Hydraulics/P03G370V01404

Forest entomology and Zoology/P03G370V01305

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			
E-mail	esilanes@uvigo.es			
Web	http://http://webs.uvigo.es/ilanes/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			

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

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>Hypoxyton 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 fungos	
(*)Práctica 2. Identificación de estruturas reproductoras de fungos	
(*)Práctica 3. Aprender a metodoloxía do repicaxe de fungos, en placas Petri e tubos roscados	
(*)Práctica 4. Illar fungos 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. & CADAHA, 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

IDENTIFYING DATA				
Forest and pasture management				
Subject	Forest and pasture management			
Code	P03G370V01704			
Study programme	Grado en Ingeniería Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	1st
Teaching language				
Department				
Coordinator	Valero Gutiérrez del Olmo, Enrique María			
Lecturers	Valero Gutiérrez del Olmo, Enrique María			
E-mail	evalero@uvigo.gal			
Web	http://http://webs.uvigo.es/mchamorro/			
General description	(*)Coñecer as bases ecolóxicas que rexen o funcionamento natural dos diversos sistemas pastorais e silvopastorais. Analizar a estrutura, manexo e xestión dos devanditos sistemas silvopastorais			

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.
B11	Ability to characterize the anatomical and technological properties of wood and non-timber forest raw materials, as well as the technologies and industries of these raw materials.
C8	Knowledge of the bases and biological foundations of the plant field in engineering.
C15	Ability to know, understand and use the principles of: forest botany.
C17	Ability to know, understand and use the principles of silviculture.
C27	Ability to know, understand and use the principles of: prevention and fight against forest fires.
C35	Ability to know, understand and use the principles of: pasciculture and agroforestry systems.
D5	Capacity for information management, analysis and synthesis
D6	Organization and planning capacity
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	C8	D5
3R. 2018 Be conscious of the multidisciplinary context of the engineering.		C15	D6
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.		C17	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.		C27	
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.		C35	
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.			
12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop 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.			
16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context.			
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			
18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions.			
19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general.			

Contents

Topic	
INTRODUCTION TO PASTORING SYSTEMS.	SUBJECT 1: General silvipastoral concepts. Basic pastoral management.
CONDITIONING AND IMPROVEMENT OF PASTURES	SUBJECT 2: The vegetal component of the grazing system. Pastoral classification systems
	SUBJECT 3: Packaging and improvement of pastures. I Rozas. The burning. Enclosures.
	SUBJECT 4: Packaging and improved pastures II: Limestone amendments. Fertilization. Irrigation and drainage.
PASTURE USE. PASCICOLOGICAL SPECIES	SUBJECT 5: Basic concepts: grazing. Segá. Nutritional value: Quantity. Bromatológico value and palatability.
	SUBJECT 6: Management of grazing systems and livestock. The quantification of production and storage
	SUBJECT 7: Control of livestock density. Grazing and control of plant fuels. Masses of trees and pastures. Ecological effects.
	SUBJECT 8: Classification of silvopastoral systems.
	SUBJECT 9: Main pasture species.

Planning

	Class hours	Hours outside the classroom	Total hours
Mentored work	10	25	35
Studies excursion	25	10	35
Lecturing	40	35	75
Objective questions exam	3	0	3
Report of practices, practicum and external practices 1		0	1
Systematic observation	1	0	1

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

Methodologies

	Description
Mentored work	1. Formulation and resolution of exercises on real situations. 2. Simulation of management over the territory. To make a herbarium with the main purpose of the herbarium is to serve to study the main grasses and legumes of our environment
Studies excursion	Collect and identify grasses and legumes.
Lecturing	Identify Grasses and legumes of silvopastoral interest

Personalized assistance

Methodologies	Description
Lecturing	They will give the subjects that are foreseen inside the subject
Mentored work	It will make a final report of the exits of field made
Studies excursion	Will take into account the assistance to the exits of field scheduled
Tests	Description
Objective questions exam	It will make a final examination

Assessment

	Description	Qualification	Training and Learning Results
Mentored work	Report of the exits of field made	20	
Studies excursion	Assistance to the visits of field	20	
Lecturing	Assistance to the theoretical classes scheduled	20	
Objective questions exam	Examination	40	

Other comments on the Evaluation**Sources of information****Basic Bibliography****Complementary Bibliography**

SAN MIGUEL, A., **Pastizales Naturales Españoles,**

RIGUEIRO, A., **Pastoreo controlado en los bosques gallegos,**

SAN MIGUEL, A., **La dehesa Española,**

ETIENNE, M., **Western European Silvopastoral Systems,**

GONZALEZ HERNANDEZ, P., **Estudio de las formaciones arboladas y arbustivas como base para su aprovechamiento cinegético,** Tesis doctoral inédita,

RIGUEIRO, A., **La utilización del ganado en el monte arbolado gallego, un paso hacia el uso integral del monte,** En: Estudios sobre prevención y efectos ecológicos de los incendios forestales, 61-78,

MONTOYA, J. M., **Pastoralismo Mediterráneo,**

SILVA, F. J., **Prácticas agroforestales en pinares y eucaliptales atlánticos,**

KNOWLES, R. L. & CUTLER, T. R., **Integration of Forestry and Pastures in New Zealand,**

Recommendations

Subjects that continue the syllabus

Biology: Plant Biology/P03G370V01201

Forestry Ecology/P03G370V01402

Subjects that are recommended to be taken simultaneously

Forestry/P03G370V01401

Forest management/P03G370V01605

Subjects that it is recommended to have taken before

Botany/P03G370V01303

Edaphology/P03G370V01302

IDENTIFYING DATA				
Wood preservation and drying technology				
Subject	Wood preservation and drying technology			
Code	P03G370V01705			
Study programme	Grado en Ingeniería Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish Galician			
Department				
Coordinator	González Prieto, Óscar			
Lecturers	González Prieto, Óscar			
E-mail	oscargprieto@uvigo.es			
Web	http://www.forestales.uvigo.es			
General description	Topics in relation with wood (timber and wood derivatives) conservation and protection, as well as the industrial drying process.			

Training and Learning Results	
Code	
B11	Ability to characterize the anatomical and technological properties of wood and non-timber forest raw materials, as well as the technologies and industries of these raw materials.
C31	Knowledge for the calculation and design of carpentry facilities. Drying, debarking and crushing of wood.
D5	Capacity for information management, analysis and synthesis
D6	Organization and planning capacity
D8	Ability to solve problems, critical reasoning and decision making

Expected results from this subject	
Expected results from this subject	Training and Learning Results
Ability to characterize the anatomical and technological properties of wood and non-timber forest raw materials, as well as the technologies and industries of these raw materials	B11
Knowledge for the calculation and design of carpentry facilities. Drying, debarking and crushing of wood.	C31
Capacity for information management, analysis and synthesis	D5
Organization and planning capacity	D6
Ability to solve problems, critical reasoning and decision making	D8

Contents	
Topic	
Technology of the conservation of the wood	Introduction: Pathologies of the wood natural Durability of the wood and *impregnabilidad Classes of use: *CU 1, *CU 2, *CU3, *CU4 and *CU5 protective Products and systems of application Wood modified: processes and products Systems of application of protective Treatments of the different wood to the employment of chemical products technical Report on pathology Measured of constructive design for the protection of the wood Reinforcements of wooden structures
Technology of the dried of the wood	Introduction: physical Principles of the dried Dried natural Dried artificial Phases of the dried artificial *Presecaderos Tunnels of dried Cameras of dried Dried of the wood by special methods Defects originated in the dried Programming and design of *secaderos

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	16	69	85
Laboratory practical	8	18	26
Studies excursion	10	6	16
Problem solving	14	5	19
Introductory activities	1	0	1
Collaborative Learning	1	0	1
Objective questions exam	1	0	1
Problem and/or exercise solving	1	0	1

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

Methodologies

Methodologies	Description
Lecturing	Lesson *magistral. Exhibition of aims and contents and importance of the same inside the group of competitions of the subject
Laboratory practical	Seminars of resolution of problems type and oral presentation
Studies excursion	Explanation "in situ" of industrial processes of dried and conservation of wood. In the case of teaching no face-to-face or *semi-face-to-face, without possibility to make exits of study, will evaluate memory of analysis of digital didactic material
Problem solving	Explanation of the handle of *secaderos. In the case of teaching no face-to-face or *semi-face-to-face, will make memory of audiovisual material employee.
Introductory activities	Presentation of the aims and development of the subject
Collaborative Learning	The tutorials will be carried out both in person or by telematic means (email, remote campus, doubt forums, Moovi). For those students who request it, they can be carried out, to the extent possible, outside the indicated hours. Both the hours and the place of the tutorials will be indicated at the beginning of the course through the officially established channels.

Personalized assistance

Methodologies	Description
Collaborative Learning	The tutoships will be carried out preferably by telematic means (email, remote campus, question forums in Moovi). For those students who request it, they may be held, as far as possible, outside the established time and place. The specific forms of communication as well as the schedules will be indicated at the beginning of the course.

Assessment

	Description	Qualification	Training and Learning Results		
Lecturing	Continuous evaluation through the assistance to the sessions. Active participation in the debate in the classroom/remote campus on the theoretical concepts. Also it will value the participation in the forums that enable in the platform Moovi	5	B11	C31	D5 D6 D8
Laboratory practical	Continuous evaluation through the assistance to the practical classes. Active participation in the debate in the classroom/remote campus on the theoretical concepts. Also it will value the participation in the forums that enable in the platform Moovi. Some test will be scheduled along the course and will be delivered through the platform Moovi	10	B11	C31	D5 D8
Studies excursion	Presentation of a memory of the visits to the real industry.	5			D5 D6 D8
Problem solving	Memory of practical activities	10	B11	C31	D5 D6 D8
Objective questions exam	Evaluation of the proof of evaluation on the theoretical contents of the subject	40	B11	C31	D5 D6 D8
Problem and/or exercise solving	Evaluation with a practical test	30	B11	C31	D5 D6 D8

Other comments on the Evaluation

Exam calendar: according to official information from the Forest Engineering School (check the official website for updated

information)

Evaluation in continuous evaluation modality; Master class: 5%, Laboratory Practices: 10%, Theoretical and practical content exam: 40% + 30 %, Exterior visit + memory: 5%, Memory of practical activities: 10 %.

Evaluation in global evaluation modality; Theoretical content exam: 40%, Theoretical/practical content exam: 40%; Alternate memory: 20%.

Sources of information

Basic Bibliography

Complementary Bibliography

Oscar González-Prieto, **Patoloxía da Madeira Estrutural**, 978-84-691-6284-2, Xunta, 2008

F. Arriaga, **Intervención en estruturas de madeira**, 978-84-8738-12-49, AITIM, 2003

Fernando Peraza, **Protección Preventiva de la Madera**, 978-84-8738-12-25, AITIM, 2002

J.I. Fernández-Golfín Seco, **Manual de secado de La Madera**, 978-84-8738-13-79, AITIM, 2007

León M. Fiske, **Manual del Secado de Maderas**, Muni Prensa, 1967

Recommendations

Subjects that continue the syllabus

Quality control and prevention of occupational hazards in the forestry industry/P03G370V01804

Subjects that are recommended to be taken simultaneously

Primary wood processing industries/P03G370V01706

Industrial organisation and processes in the wood industry/P03G370V01707

Subjects that it is recommended to have taken before

Wood technology/P03G370V01606

Other comments

Eligible subject for dual training projects as established by the memory of the degree.

IDENTIFYING DATA				
Primary wood processing industries				
Subject	Primary wood processing industries			
Code	P03G370V01706			
Study programme	Grado en Ingeniería Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish Galician			
Department				
Coordinator	González Prieto, Óscar			
Lecturers	Bartolome Mier, Javier González Prieto, Óscar			
E-mail	oscargprieto@uvigo.es			
Web	http://www.forestaes.uvigo.es			
General description	Study of the manufacturing technologies of two basic products of forest origin (first transformation): sawn wood and boards production			

Training and Learning Results

Code	
B11	Ability to characterize the anatomical and technological properties of wood and non-timber forest raw materials, as well as the technologies and industries of these raw materials.
B12	Capacity for organization and planning of companies and other institutions, with knowledge of the legislative provisions that affect them and the fundamentals of marketing and marketing of forest products.
C29	Ability to know, understand and use the basic principles of the processes of first transformation of wood and the principles of: non-wood forest raw materials; industrial processes of non-wood products: cork, resin, essential oils.
D4	Sustainability and environmental commitment
D8	Ability to solve problems, critical reasoning and decision making

Expected results from this subject

Expected results from this subject	Training and Learning Results
New	B11
New	B12
New	C29
New	D4
New	D8

Contents

Topic	
Introduction to the subject.	Presentation of the sector of first transformation of the wood in Galicia, Spain and Europe
Technology of the sawed of the wood	Wooden section in roll Section of court of the trunk Section of manipulation of the wood sawed Machinery of sawed Systems of sawed of the wood Lines of processed
The cut of the wood	Characteristics of the tool Preparation and conservation of tools of court Parameters of court Definition of the tool of court
Manufacture of wooden sheet to the flat	Definition and use of the wooden sheet to the flat Process of manufacture of the wooden sheet to the flat
Manufacture of boards plywoods	Definition, properties and types of board plywood Process of manufacture of the board plywood
Manufacture of boards of particles and wooden fibres	Boards of particles. Properties, uses and process of manufacture Boards of hard fibre. Properties, uses and process of manufacture Boards of fibre of half density. Properties, uses and process of manufacture
Properties and employment of the main wooden species of industrial use	Physical characteristics, mechanical and applications of the main wooden species of conifers, leafy and tropical

Planning			
	Class hours	Hours outside the classroom	Total hours
Lecturing	35	87	122
Studies excursion	4	2	6
Laboratory practical	16	0	16
Introductory activities	1	0	1
Collaborative Learning	1	0	1
Problem and/or exercise solving	1	0	1
Report of practices, practicum and external practices	0	2	2
Essay questions exam	1	0	1

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

Methodologies	
	Description
Lecturing	Exhibition of aims and contents and importance of the same inside the group of the competitions of the subject
Studies excursion	Explanation "in situ" of industrial processes in factories of first transformation of the wood
Laboratory practical	Macroscopic recognition of commercial wooden species in Spain
Introductory activities	Exhibition of the aims and development of the subject
Collaborative Learning	The tutorials will be carried out both in person or by telematic means (email, remote campus, doubt forums, Moovi). For those students who request it, they can be carried out, to the extent possible, outside the indicated hours. Both the hours and the place of the tutorials will be indicated at the beginning of the course through the officially established channels.

Personalized assistance

Methodologies	Description
Collaborative Learning	The tutorships will be carried out both in person or by telematic means (email, remote campus, doubt forums, Moovi). For those students who request it, they can be carried out, to the extent possible, outside the indicated hours. Both the hours and the place of the tutorials will be indicated at the beginning of the course through the officially channels.

Assessment					
	Description	Qualification	Training and Learning Results		
Lecturing	Continuous evaluation through the assistance to the classes of classroom	10	B11 B12	C29	D4 D8
Laboratory practical	Macroscopic recognition of the commercial wood in Spain	20	B12	C29	D8
Report of practices, practicum and external practices	Preparation and delivery by heart of guide of the commercial wooden species in Spain	30	B11	C29	D8
Essay questions exam	Evaluation by means of proof of knowledges	40	B11 B12		D4 D8

Other comments on the Evaluation

Exam calendar: according to official information from the Forest Engineering School (check the official website for updated information)

Evaluation in continuous evaluation modality; Master class: 10%, Laboratory Practices: 20%, Theoretical content exam: 40%, Practical memory delivery: 30%.

Evaluation in global evaluation modality; Theoretical content exam: 35%, Theoretical/practical content exam: 35%; Alternate memory: 30%.

Sources of information

Basic Bibliography

González-Prieto, Óscar, **¿Cómo se fabrican los productos de madera? Tomo I**, 978-84-87381-50-8, AITIM, 2020
 González-Prieto, Óscar, **¿Cómo se fabrican los productos de madera? Tomo II**, 978-84-87381-51-5, AITIM, 2020
 González-Prieto, Óscar, **¿Cómo se fabrican los productos de madera? Tomo IV**, 978-84-87381-53-9, AITIM, 2021

Complementary Bibliography

González-Prieto, Óscar, **¿Cómo se fabrican los productos de madera? Tomo III**, 978-84-87381-52-2, AITIM, 2021

Recommendations

Subjects that continue the syllabus

Quality control and prevention of occupational hazards in the forestry industry/P03G370V01804

Subjects that are recommended to be taken simultaneously

Industrial organisation and processes in the wood industry/P03G370V01707

Wood preservation and drying technology/P03G370V01705

Subjects that it is recommended to have taken before

Wood technology/P03G370V01606

Other comments

Eligible subject for dual training projects as established by the memory of the degree.

IDENTIFYING DATA				
Organización industrial e procesos na industria da madeira				
Subject	Organización industrial e procesos na industria da madeira			
Code	P03G370V01707			
Study programme	Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4	1c
Teaching language	#EnglishFriendly Castelán Galego			
Department				
Coordinator	González Prieto, Óscar			
Lecturers	González Prieto, Óscar			
E-mail	oscargprieto@uvigo.es			
Web	http://www.forestales.uvigo.es			
General description	Materia relacionada cos procesos industriais de transformación da madeira, especialmente os que se levan a cabo na fabricación dos produtos finais, así como as técnicas de xestión e mellora continua da produción.			

Resultados de Formación e Aprendizaxe	
Code	
B12	Capacidade de organización e planificación de empresas e outras institucións, con coñecemento das disposicións legislativas que lles afectan e dos fundamentos do márketing e comercialización de produtos forestais.
C30	Capacidade para coñecer, comprender e utilizar os principios de: coñecemento dos principios básicos dos procesos de segunda transformación da madeira.
C31	Coñecementos para o cálculo e deseño de instalacións de carpintería. Secado, descortizado e trituración da madeira.
D5	Capacidade para a xestión da información, análise e síntese
D8	Capacidade para resolver problemas, razoamento crítico e toma de decisións

Resultados previstos na materia	
Expected results from this subject	Training and Learning Results
Capacidade de organización e planificación de empresas e outras institucións, con coñecemento das disposicións legislativas que lles afectan e dos fundamentos do márketing e comercialización de produtos forestais.	B12
Capacidade para coñecer, comprender e utilizar os principios de: coñecemento dos principios básicos dos procesos de segunda transformación da madeira.	C30
Coñecementos para o cálculo e deseño de instalacións de carpintería. Secado, descortizado e trituración da madeira.	C31
Capacidade para a xestión da información, análise e síntese	D5
Capacidade para resolver problemas, razoamento crítico e toma de decisións	D8

Contidos	
Topic	
O sector de segunda transformación da madeira	A industria da carpintería e o moble en: · Galicia · España · Europa
Operacións industriais sobre madeira e taboleiros	Industria 4.0. Robotización. Mecanización de madeira e taboleiros Adhesivos e técnicas de encolado na industria da madeira Aplicación de cantos sobre taboleiros Aplicación de superficies decorativas sobre taboleiros Prácticas de lixado en carpintería e moble Tecnoloxía do acabado sobre madeira e taboleiros
Principios básicos e ferramentas de xestión da produción	Conceptos básicos Función de aprovisionamento Estratexias da cadea de subministracións
Xestión de inventarios	Introdución Xestión de inventarios: conceptos básicos Modelos de xestión de inventarios

Planificación agregada	Introducción Planificación agregada: conceptos básicos Plan agregado de producción
Plan de necesidades de materiais	Introducción Elementos do sistema MRP Técnicas para determinar a dimensión dos lotes
Principios básicos e ferramentas para a mellora continua na organización da produción industrial	Conceptos básicos de xestión Lean e excelencia na produción Aplicación da xestión Lean á industria da madeira Outras ferramentas: JIT, seis-sigma

Planificación			
	Class hours	Hours outside the classroom	Total hours
Actividades introductorias	2	0	2
Lección maxistral	20	40	60
Resolución de problemas	13	28	41
Traballo tutelado	7	20	27
Saídas de estudo	7	10	17
Aprendizaxe colaborativa	1	0	1
Resolución de problemas e/ou exercicios	1	0	1
Exame de preguntas de desenvolvemento	1	0	1

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

Metodoloxía docente	
	Description
Actividades introductorias	Introdución aos obxectivos e desenvolvemento da materia.
Lección maxistral	Exposición estruturada de obxectivos, contidos teóricos e exemplificacións dos temas e subtemas que forman o programa da materia. Dita exposición realizarase na aula de maneira presencial ou a través do campus remoto. O alumnado disporá de todo o material para poder seguir as clases de forma non presencial.
Resolución de problemas	Participación activa do alumnado na resolución dos problemas e/ou exercicios.
Traballo tutelado	Resolución de pequenos exercicios prácticos que acompañan unha explicación teórica. Seminarios de formulación e resolución de problemas tipo con presentación oral.
Saídas de estudo	Explicación "in situ" da organización e procesos industriais en industrias de carpintería e moble. A saída de prácticas planificada non se realizará no caso de docencia non presencial ou no caso de que non se permita con docencia semi-presencial. Substituirase por observación práctica de material audiovisual de procesos de fabricación de industrias da madeira (vídeos e información dixital).
Aprendizaxe colaborativa	As titorías realizaranse tanto presencialmente ou por medios telemáticos (correo electrónico, campus remoto, foros de dúbidas, Moovi). Para aquel alumno ou alumna que o solicite, poderanse realizar, na medida do posible, fora dos horarios indicados. Indicarase a comezo de curso por os canles establecidos os horarios e lugar das tutorías.

Atención personalizada	
Methodologies	Description
Aprendizaxe colaborativa	As titorías realizaranse tanto presencialmente ou por medios telemáticos (correo electrónico, campus remoto, foros de dúbidas, Moovi). Para aquel alumno ou alumna que o solicite, poderanse realizar, na medida do posible, fora dos horarios indicados. Indicarase a comezo de curso por os canles establecidos os horarios e lugar das tutorías.

Avaliación			
	Description	Qualification	Training and Learning Results
Lección maxistral	Participación activa no debate que se expoña na aula/campus remoto sobre os conceptos teóricos. Tamén se valorará a participación nos foros que se habiliten na plataforma Moovi	10	C30 C31
Traballo tutelado	Participación activa nos seminarios de resolución de exercicios e de casos/análises de situacións, con críticas construtivas ás resolucións doutros compañeiros e entrega en tempo e forma dos traballos encomendados.	10	C30 C31

Saídas de estudo	Presentación dunha memoria das visitas realizadas. No caso de docencia non presencial ou semi-presencial, avaliarase memoria de observación de material didáctico en forma de vídeos de procesos industriais de carpintaría e moble.	5	C30 C31
Resolución de problemas e/ou exercicios	Probas escritas sobre os contidos teóricos e prácticos da materia. Algunhas probas serán planificadas ao longo do curso e serán entregadas a través da plataforma de Teledocencia	35	C30 C31
Exame de preguntas de desenvolvemento	Proba de avaliación de coñecementos prácticos	40	B12 C30 D5 C31 D8

Other comments on the Evaluation

Calendario de exames: segundo a información oficial da Escola de Enxeñaría Forestal (consulta o sitio web oficial para obter información actualizada)

Avaliación na modalidade de avaliación continua; Clase maxistral: 10%, Traballo tutelado: 10%, Exame de contidos teóricos: 40%, Exame de contidos prácticos: 35%, Saída dos estudos e entrega de memoria: 5%.

Avaliación na modalidade de avaliación global; Exame de contidos teóricos: 35%, Exame de contidos teóricos/prácticos: 35%; Entrega de memoria alternativa: 30 %.

Bibliografía. Fontes de información

Basic Bibliography

Jay Heizer, Barry Render, **Dirección de la producción y de operaciones : decisiones tácticas**, 978-84-8322-36-11, 11, Pearson Educación, 2015

Complementary Bibliography

Carlos Rodrigo Illera, María Pilar Alberca Oliver, **Dirección de la producción**, 978-84-1555-07-78, Sanz y Torres, 2015

Lluís Cuatrecasas Arbós, **Organización de la producción y dirección de operaciones : sistemas actuales de gestión eficiente y competitiva**, 978-84-8004-41-34, Díaz de Santos, 2011

Tony Crespo Franco, Pilar Piñeiro García, **Producción : planificación, programación e control : ejercicios resoltos**, 978-84-8158-28-71, Universidade de Vigo, Servizo de Publicacións, 2005

Daniel Arias Aranda, Beatriz Minguela Rata (directores), **Dirección de la producción y operaciones : decisiones operativas**, 978-84-3683-91-11, Pirámide, 2018

Javier Santos, Richard A. Wysk, José Manuel Torres, **Mejorando la producción con lean thinking**, 978-84-3683-28-22, 2, Pirámide, 2015

Recomendacións

Subjects that are recommended to be taken simultaneously

Industrias de primeira transformación da madeira/P03G370V01706

Subjects that it is recommended to have taken before

Tecnoloxía da madeira/P03G370V01606

Other comments

Materia Elejixible para proxectos de formación dual segundo o establecido pola memoria da titulación.

IDENTIFYING DATA				
Innovación e desenvolvemento de produtos na industria da madeira				
Subject	Innovación e desenvolvemento de produtos na industria da madeira			
Code	P03G370V01708			
Study programme	Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4	1c
Teaching language				
Department				
Coordinator				
Lecturers				
E-mail				
Web				
General description				
Resultados de Formación e Aprendizaxe				
Code				
Resultados previstos na materia				
Expected results from this subject		Training and Learning Results		
Contidos				
Topic				
Planificación				
	Class hours	Hours outside the classroom	Total hours	
*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.				
Metodoloxía docente				
	Description			
Atención personalizada				
Avaliación				
Description	Qualification	Training and Learning Results		
Other comments on the Evaluation				
Bibliografía. Fontes de información				
Basic Bibliography				
Complementary Bibliography				
Recomendacións				

IDENTIFYING DATA				
Innovación e desenvolvemento de produtos na industria forestal				
Subject	Innovación e desenvolvemento de produtos na industria forestal			
Code	P03G370V01709			
Study programme	Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4	1c
Teaching language	Castelán Galego			
Department				
Coordinator	Bartolome Mier, Javier			
Lecturers	Bartolome Mier, Javier Tellería Couñago, José Ángel			
E-mail	jbartolome@uvigo.es			
Web				
General description	Materia que trata sobre os procesos industriais de transformación da madeira, especialmente os que se levan a cabo na fabricación dos produtos finais, así como as técnicas de xestión e mellora continua de a produción			

Resultados de Formación e Aprendizaxe	
Code	
C31	Coñecementos para o cálculo e deseño de instalacións de carpintería. Secado, descortizado e trituración da madeira.
D4	Sostenibilidade e compromiso ambiental
D6	Capacidade de organización e planificación
D10	Aprendizaxe autónoma.

Resultados previstos na materia	
Expected results from this subject	Training and Learning Results
2R. 2018 Coñecemento e comprensión das disciplinas de enxeñaría da súa especialidade, ao nivel necesario para adquirir o resto das competencias da titulación, incluíndo nocións dos últimos avances.	C31 D4 D6 D10
3R. 2018 Ser consciente do contexto multidisciplinar da enxeñaría.	
4R. 2018 Capacidade para analizar produtos, procesos e sistemas complexos no seu campo de estudo; elixir e aplicar métodos analíticos, de cálculo e experimentais relevantes de forma relevante e interpretar correctamente os resultados destas análises.	
5R. 2018 Capacidade para identificar, formular e resolver problemas de enxeñaría na súa especialidade; escoller e aplicar métodos analíticos, de cálculo e experimentos adecuadamente establecidos; Recoñecer a importancia das restricións sociais, de saúde e seguridade, ambientais, económicas e industriais.	
7R. 2018 Capacidade do proxecto utilizando algúns coñecementos avanzados da súa especialidade en enxeñaría.	
9R. 2018 Capacidade para consultar e aplicar códigos de boas prácticas e seguridade da súa especialidade.	
11R. 2018 Comprensión das técnicas e métodos de análise, proxecto e investigación aplicables e as súas limitacións no ámbito da súa especialidade.	
13R. 2018 Coñecemento da aplicación de materiais, equipos e ferramentas, procesos tecnolóxicos e de enxeñaría e as súas limitacións no ámbito da súa especialidade.	
14R. 2018 Capacidade para aplicar normas de enxeñaría na súa especialidade.	
15R. 2018 Coñecemento das implicacións sociais, de saúde e seguridade, ambientais, económicas e industriais da práctica en enxeñaría.	
16R. 2018 Ideas xerais sobre cuestións económicas, organizativas e de xestión (como xestión de proxectos, xestión de riscos e cambio) no contexto industrial e empresarial.	
18R. 2018 Capacidade para xestionar actividades ou proxectos técnicos ou profesionais complexos da súa especialidade, asumindo a responsabilidade da toma de decisións.	
19R. 2018 Capacidade para comunicar de xeito eficaz información, ideas, problemas e solucións no campo da enxeñaría e coa sociedade en xeral.	
20R. 2018 Capacidade para funcionar eficazmente en contextos nacionais e internacionais, individualmente e en equipo, e cooperar cos enxeñeiros e persoas doutras disciplinas.	
21R. 2018 Capacidade para recoñecer a necesidade dunha formación continua e realizar esta actividade de xeito independente durante a súa vida profesional.	
22R. 2018 Capacidade para estar ao día das novas científicas e tecnolóxicas.	

Contidos	
Topic	
1.- Materiais tecnificados de madeira	1.1.Taboleiros derivados de madeira 1.2 Perfís lamelados de madeira 1.3 Madeira microlaminada (LVL) 1.4 Madeira reconstituída con tiras (PSL) 1.5 Madeira reconstituída con virutas (LSL) 1.6 Madeira reconstituída con pequenas virutas (OSL) 1.7 Madeira plástico
2.- Compoñentes de madeira	2.1 Cercos e precercos 2.2 Tapajuntas 2.3 Molduras decorativas 2.4 Madeiras torneadas 2.5. Madeira curvada 2.6 Perfís lamelados
3.- Herraxes	3.1 Patas, pés e elementos de apoio- nivelación. 3.2 Elementos de unión e ensamblaxe. 3.3 Bisagras. 3.4 Sistemas de guiado. 3.5 Elementos de instalación e montaxe. 3.6 Cerraduras e pechaduras
4.-Recubrimientos de taboleiros e cantos de madeira.	4.1 Recubrimientos de cantos. 4.1.1 A base de listones de madeira maciza. 4.1.2 A base de chapas de madeira. 4.1.3 A base de láminas de PVC. 4.1.4 A base de papel decorativo. 4.2.- Recubrimientos de taboleiros. 4.2.1 A base de chapa de madeira. 4.2.2 A base de papeis impregnados. 4.2.3 Lamelados. 4.2.4 Lacados.
5.- Acabados en carpintería e mobles	5.1 Introducción. 5.2 Clasificación de os acabados. 5.2.1 Pola función de o verniz. 5.2.2 Pola composición química de o verniz. 5.3 Compoñentes dun acabado. 5.3.1 Disolventes. 5.3.2 Resinas. 5.3.3 Tintes e aditivos. 5.3.4 Cargas. 5.4 Vernices secado uv
6.- Portas de madeira	6.1 Introducción. 6.2 Clasificación das portas. 6.2.1 Pola súa constitución. 6.2.2 Polo aspecto das súas caras. 6.2.3 Pola forma do canto. 6.2.4 Pola aparencia do canto. 6.3 Medidas e tolerancias dunha porta. 6.4 Características da madeira. 6.5 Puertas en función da súa constitución 6.5.1 Puertas á plana. 6.5.2 Puertas de carpintería. 6.5.3 portas de carpintería en relevo. 6.6 Portas especiais 6.6.1 Puertas a resistentes a o lume. 6.6.2 Portas acústicas. 6.6.3 Puertas de seguridade
7.- Fiestras de madeira	7.1 Introducción. 7.2 Elementos que constitúen unha fiestra. 7.2.1 Elementos do oco da fiestra. 7.2.2 Elementos da fiestra. 7.3 Características dunha fiestra de madeira. 7.3.1 Permeabilidade ao aire. 7.3.2 Resistencia ao vento. 7.3.3 Estanqueidad á auga. 7.3.4 Acristalamiento

8.- Chans de madeira	8.1 Entablados 8.2 Tarimas 8.3 Lamparquet 8.4 Parquet multicapa 8.5 Paneis 8.5.1 Parquet taraceado 8.5.2 Parquet industrial 8.5.3 Paneis de deseños históricos 8.5.4 Paneis multicapa 8.6 Entarugado 8.7 Pavimentos de de taboleiro rechapado 8.8 chans lamelados 8.9 Chans madeira plástico (pwc)
9.- Escaleiras de madeira	9.1 Introducción 9.2 Definicións 9.3 Tipoloxía de escaleiras 9.3.1 Tipoloxía estruturais 9.3.2 Tipoloxía por trazado 9.4 Aspectos técnicos no deseño dunha escaleira
10.- Ergonomía e moble	10.1 Conceptos xerais 10.2 Bases científicas na ergonomía 10.3 Implicacións no deseño de mobiliario da postura sedente. 10.4 Táboas antropométricas.
11.- Mobles modulares	11.1 Conceptos xerais 11.2 Materiais mobles modulares 11.3 Compoñentes dos mobles modulares 11.4 Despiece dos mobles modulares
12.- Mobles de madeira maciza.	12.1 Conceptos xerais 12.2 Materiais mobles modulares 12.3 Compoñentes dos mobles modulares 12.4 Despiece dos mobles modulares
13.- Mobles atamborados e outros	13.1 Conceptos xerais 13.2 Materiais mobles modulares 13.3 Compoñentes dos mobles modulares 13.4 Despiece dos mobles modulares
14.- Introducción á innovación e novos produtos	14.1 Conceptos básicos sobre innovación 14.2 A xestión da innovación e a I+D 14.3 Tipos de innovación
15.- Técnicas de traballo en equipo e creatividade	15.1 Creatividade e procesos 15.2 Técnicas para a creación e xestión de innovación de produtos
16.- Fases dun proxecto de desenvolvemento de novos produtos	16.1 Fases dun proxecto de desenvolvemento de novos produtos

Planificación

	Class hours	Hours outside the classroom	Total hours
Lección maxistral	23	66	89
Prácticas con apoio das TIC	6	8	14
Prácticas de laboratorio	4	6	10
Traballo tutelado	15	18	33
Resolución de problemas e/ou exercicios	2	0	2
Presentación	2	0	2

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

Metodoloxía docente

	Description
Lección maxistral	Explicación de conceptos teóricos e exemplificaciónes. Farase de forma presencial, a través do campus remoto e/ou plataforma de teledocencia
Prácticas con apoio das TIC	Resolución de casos prácticos de deseño de mobles modulares. Farase de forma presencial, a través do campus remoto e/ou plataforma de teledocencia
Prácticas de laboratorio	Actividades de aplicación dos coñecementos a situacións concretas e de adquisición de habilidades básicas e procedimentais relacionadas coa materia obxecto de estudo. Desenvolverase nun espazo especial co equipamento adecuado. En caso de non ser posible a súa realización, facilitaranse os materiais para o seu asimilación e serán substituídas pola realización dun traballo

Traballo tutelado	O estudante realizará un proxecto de desenvolvemento dun novo produto tanto na aula (de forma presencial, a través do campus remoto e/ou plataforma de teledocencia) como de maneira autónoma baixo as directrices e a supervisión do profesor. O traballo poderá realizarse de forma individual e/ou grupal
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Atención personalizada

Methodologies	Description
Lección maxistral	As titorías realizaranse preferentemente por medios telemáticos (correo electrónico, campus remoto, foros de dúbidas en FaiTIC). Para aquel alumno ou alumna que o solicite poderanse realizar, na medida do posible, presencialmente. Indicaranse ao comezo do curso as formas concretas de comunicación así como os horarios.
Prácticas con apoio das TIC	As titorías realizaranse preferentemente por medios telemáticos (correo electrónico, campus remoto, foros de dúbidas en FaiTIC). Para aquel alumno ou alumna que o solicite poderanse realizar, na medida do posible, presencialmente. Indicaranse ao comezo do curso as formas concretas de comunicación así como os horarios.
Traballo tutelado	As titorías realizaranse preferentemente por medios telemáticos (correo electrónico, campus remoto, foros de dúbidas en FaiTIC). Para aquel alumno ou alumna que o solicite poderanse realizar, na medida do posible, presencialmente. Indicaranse ao comezo do curso as formas concretas de comunicación así como os horarios.

Avaliación

	Description	Qualification	Training and Learning Results
Lección maxistral	Asistencia e participación activa nas sesións maxistrais	10	C31 D4 D6
Prácticas de laboratorio	Actividades de aplicación dos coñecementos a situacións concretas e de adquisición de habilidades básicas e procedimentais relacionadas coa materia obxecto de estudo.	5	C31 D4 D6 D10
Traballo tutelado	O ou a estudante realizará un proxecto de desenvolvemento dun novo produto. A súa entrega farase a través da plataforma de teledocencia, non admitíndose entregas a través de ningunha outra vía	40	D6 D10
Resolución de problemas e/ou exercicios	Proba escrita a final de curso (presencial, campus remoto e/ou plataforma de teledocencia) para a avaliación das competencias adquiridas ao longo do curso	35	C31 D4 D6 D10
Presentación	Exposición proxecto de desenvolvemento dun novo produto	10	D4 D6 D10

Other comments on the Evaluation

O alumno que non se acolla ao réxime de avaliación continua terá que facer unha renuncia por escrito nun prazo non superior ao prazo fixado polo centro. O alumno que non se acolla á avaliación continua terá que realizar un O alumno que non se acolla ao réxime de avaliación continua terá que facer un exame práctico en campo e un exame nos que se avaliasen os conceptos teóricos e prácticos da materia, mediante preguntas tipo test, e de desenvolvemento teórico, así como exercicios prácticos.

A Materia consta de dous partes:

- a) Lección maxistral, prácticas de laboratorio e resolución de problemas e/ou exercicios (5 puntos)
- b) Traballo tutelado (5 puntos)

É necesario obter polo menos un 3,5 sobre 10 en cada parte para poder proceder a realizar a suma. En caso contrario, a materia considerárase non superada e cualifícase coa menor das notas obtidas.

É necesario obter polo menos un 3,5 sobre 10 en cada parte para poder proceder a realizar a suma. En caso contrario, a materia se considerará non superada e se cualificará coa menor das notas obtidas.

As datas oficiais e as posibles modificacións están expostas no taboleiro oficial da EE Forestal e na web http://forestales.uvigo.es/*gl/

Bibliografía. Fontes de información

Basic Bibliography

Complementary Bibliography

Morales Nieto, E., **Innovar o morir : Cómo obtener resultados excepcionales con poca inversión : Innovación, internacionalización, redes comerciales**, Starbok, 2010

Philip Kotler, Gary Armstrong, **Fundamentos de marketing**, 13, Pearson Educación de México, 2017

Francisco Serrano Gómez, César Serrano Domínguez, **Gestión, dirección y estrategia de productos**, ESIC, 2005

Andrés Fernández Romero, **Creatividad e innovación en empresas y organizaciones : técnicas para la resolución de problemas**, Díaz de Santos, 2005

Alexander Osterwalder, Yves Pigneur, **Generación de modelos de negocio : un manual para visionarios, revolucionarios y retadores**, 12, Deusto, 2014

Recomendaciones

Subjects that continue the syllabus

Impacto ambiental/P03G370V01504

Subjects that are recommended to be taken simultaneously

Control de calidad e prevención de riesgos laborales na industria forestal/P03G370V01804

Subjects that it is recommended to have taken before

Fundamentos de economía da empresa/P03G370V01104

Tecnoloxía da madeira/P03G370V01606

Tecnoloxía do secado e conservación de madeiras/P03G370V01705

Other comments

Materia Elegible para proxectos de formación dual segundo o establecido pola memoria da titulación.

IDENTIFYING DATA				
Xestión de espazos protexidos e biodiversidade				
Subject	Xestión de espazos protexidos e biodiversidade			
Code	P03G370V01801			
Study programme	Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4	2c
Teaching language	Castelán Galego			
Department	Ecología e biología animal			
Coordinator	Cordero Rivera, Adolfo			
Lecturers	Álvarez Jiménez, Maruxa Cordero Rivera, Adolfo			
E-mail	adolfo.cordero@uvigo.gal			
Web	http://ecoevo.uvigo.es			
General description	Introdución aos principios da Bioloxía da Conservación aplicados á Xestión de Espazos protexidos e Conservación da Biodiversidade			

Resultados de Formación e Aprendizaxe	
Code	

Resultados previstos na materia	
Expected results from this subject	Training and Learning Results

Contidos	
Topic	
1. A Ciencia da Conservación.	Oríxenes e breve historia dos movementos conservacionistas. Principios da biología da conservación. Ecología e ecologismo. Importancia da ciencia na conservación.
2. Valores e funcións ecolóxicas da biodiversidade.	Diversidade xenética, específica e ecosistémica: o concepto de biodiversidade. ¿Por que se deben conserva-las especies? O valor intrínseco das especies e o seu estatus de conservación. Os valores instrumentais e a rareza das especies. Os valores ecosistémicos.
3. Biodiversidade e estabilidade.	O concepto de estabilidade. O debate diversidade-estabilidade (a historia da controversia, estudos actuais, compartimentación, diversidade e cambio global, implicacións para a biología da conservación). Retrogresión.
4. Principios ecolóxicos na explotación de recursos naturais.	Concepto de rendemento óptimo. Principios para a explotación das poboacións. Cambios xenéticos nas poboacións explotadas. A explotación dos bosques. Certificación forestal (FSC, PEFC).
5. A extinción.	Número de especies que habitan o planeta. Causas da rareza das especies. Clasificación IUCN. Estimación da taxa de extinción. Procesos e causas de extinción. Degradación e destrución de hábitats. Dinámica metapoboacional. Análise de viabilidade de poboacións (PVA).
6. Xestión de especies e poboacións.	Unidades de xestión. Conservación in situ e ex situ. Recursos escasos. Control das ameazas. Traslados e cría artificial. O papel dos zoolóxicos, xardíns botánicos e museos. Importancia da etoloxía na conservación. Caso práctico: o exemplo do furón de patas negras.
7. Xestión e restauración de ecosistemas.	Principios da xestión de ecosistemas. Ecosistemas modificados (explotación forestal, ecosistemas agropecuarios, ecosistemas acuáticos). Restauración de ecosistemas.
8. Os factores sociais na conservación.	Descrición de valores. Valoración de prioridades. Os cambios culturais. A educación ambiental. Estratexia galega de educación ambiental.
9. A economía da conservación.	Valoración económica da diversidade biolóxica (tipos de sostibilidade, modelos de decisión en economía ecolóxica, o valor da biodiversidade). Custes da conservación (método do custe da viaxe, método das preferencias reveladas, unha perspectiva ecolóxica e económica do mercado). A traxedia dos bens comunais.

10. Acción política e conservación.	Organizacións internacionais (UICN, o programa MaB). Axencias do goberno: A estratexia española de desenvolvemento sostible. Estratexia española para a conservación da biodiversidade. As organizacións non gobernamentais (ONGs). Empresas e individuos. Investigación científica, política e conservación. O ecoloxismo coma ideoloxía política.
11. Deseño de reservas e parques protexidos.	Obxectivos da creación de reservas (o problema da fragmentación). Representación da biodiversidade. Características cruciais do deseño de reservas: tamaño, dinámica, contexto espacial, conectividade, zonas de amortiguación. Espacios Naturais protexidos de Galicia.
12. Xestión de Espazos Protexidos	Estrutura da xestión: órgano reitor, órgano colaborador e órgano xestor. Recursos humanos. Recursos financeiros. Marco legal da xestión: lexislación internacional, nacional e autonómica. Zonificación e os seus instrumentos (PORN, PRUX).
13. Os plans de xestión de especies ameazadas.	Directrices, obxectivos e viabilidade. Exemplos: o plan de recuperación do sapoconcho europeo (<i>Emys orbicularis</i>) en Galicia; Plan de xestión das poboacións de libeliñas (Odonatos) de interese europeo; Bioloxía reproductiva e xestión da camariña (<i>Corema album</i>) nas Illas Cíes.
Práctica 1. Deseño de reservas: posta a proba da relación especies-área.	Empregando un programa de simulación, estimación da relación especies/área e dos efectos diana e rescate.
Práctica 2. Principios taxonómicos e características das comunidades. O seu uso no proceso de toma de decisións sobre conservación.	Mediante mostras simuladas de coleópteros de tres illas, establecemento de prioridades de conservación baseándose no concepto morfolóxico de especie
Práctica 3. Debate sobre a pesca comercial nun Parque Nacional.	Mediante un xogo de rol expóranse as diferentes posturas sobre a pesca e a conservación nun parque nacional, empregando información do P.N. das Illas Atlánticas de Galicia e do P.N. das illas Galápagos
Práctica 4. Análise de viabilidade de poboacións mediante o programa VORTEX.	Simulación de estratexias de xestión de poboacións ameazadas.
Práctica 5. Saída de campo. Visita ao Centro de Recursos Zooxenéticos de Galicia en Coles (Ourense)	Estudio dos sistemas de conservación de xermoplasma de razas autóctonas de gando.
Práctica 6. Saída de campo. Visita ao Parque Natural das Fragas do Eume.	Toma de contacto coa xestión real dunha área protexida, coas súas características e problemas específicos.
Práctica 7. Saída de campo. Visita ao Parque Nacional das Illas Atlánticas de Galicia. Illa de Cortegada.	Vistas as particularidades do Parque, coa súa insularidade, a visita será ao centro de recepción de visitantes en Vigo, se as condicións loxísticas e climáticas así o aconsellan.

Planificación

	Class hours	Hours outside the classroom	Total hours
Lección maxistral	30	52.5	82.5
Saídas de estudo	11	16.5	27.5
Traballo tutelado	5	25	30
Prácticas con apoio das TIC	4	6	10

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

Metodoloxía docente

	Description
Lección maxistral	Exposición por parte do profesor dos conceptos mais relevantes da materia
Saídas de estudo	Comprensión dos conceptos clave mediante saídas de estudo.
Traballo tutelado	Traballo sobre temas específicos, que se entregará antes da avaliación
Prácticas con apoio das TIC	Estudo de conceptos clave mediante simulacións de ordenador.

Atención personalizada

Avaliación

	Description	Qualification Training and Learning Results
Lección maxistral	Avaliarase mediante exames de resposta curta.	40
Saídas de estudo	Avaliaranse tendo en conta a asistencia e participación	10

Traballo tutelado	Entrega dun traballo monográfico sobre o libro "A sand county almanac", de Aldo Leopold. O traballo debe ser entregado un mes antes da data do exame. Debe consistir nun resumo do libro e dun apartado de análise personal do mesmo.	20
Prácticas con apoio das TIC	Avaliaranse no exame da materia mediante preguntas específicas ou ben mediante traballos.	30

Other comments on the Evaluation

As competencias da materia serán avaliadas no exame escrito.

A asistencia ás prácticas é obrigatoria. A ausencia inustificada a máis dunha práctica implica unha avaliación negativa.

O traballo monográfico sobre o libro de Aldo Leopold é condición imprescindible para a avaliación, e debe entregarse como máximo dúas semanas antes do exame.

Bibliografía. Fontes de información

Basic Bibliography

Leopold, Aldo, **A sand county almanac (versión española: Una ética de la tierra)**, Oxford University Press, 1949

Complementary Bibliography

Primack, R.B. & J. Ros, **Introducción a la Biología de la Conservación**, Ariel, 2002

Cordero Rivera, A. (Editor), **Proxecto Galicia, Ecoloxía. Volumen 45. Conservación I.**, Hércules de Ediciones, 2005

Hunter, M.L., **Fundamentals of Conservation Biology**, Blackwell Science, 2002

Sutherland, W.J., **The Conservation Handbook: Research, Management and Policy**, Blackwell Science, 2000

Shafer, C. L., **Nature Reserves**, Smithsonian Institution Press, 1990

James P. Gibbs, Malcolm L. Hunter, Jr., Eleanor J. Sterling, **Problem-solving in conservation biology and wildlife management: exercises for class, field, and laboratory**, 2, Blackwell Science, 2008

Recomendacións

Subjects that it is recommended to have taken before

Ecoloxía forestal/P03G370V01402

IDENTIFYING DATA				
Forest Fires				
Subject	Forest Fires			
Code	P03G370V01802			
Study programme	Grado en Ingeniería Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	2nd
Teaching language	#EnglishFriendly Spanish Galician			
Department				
Coordinator	Fernández Alonso, José María			
Lecturers	Fernández Alonso, José María			
E-mail	josemfernandez@uvigo.es			
Web				
General description	Technicians of prevention *and extinction of forest *fires. : English Friendly subject: International students may request from the teachers: a) resources and bibliographic references in English, b) tutoring sessions in English, c) exams and assessments in English.			

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 .
B13	Ability to design, direct, elaborate, implement and interpret projects and plans, as well as to write technical reports, recognition reports, assessments, appraisals and appraisals.
C9	Ability to know, understand and use the principles of: forestry hydraulics; hydrology and hydrological-forest restoration.
C27	Ability to know, understand and use the principles of: prevention and fight against forest fires.
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 B3 B13	C9 C27	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.			
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.			
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.			
12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop 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.			
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			
18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions.			
19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general.			
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

1. Forest fires.	Definition. General characteristics. Causality. Socioeconomic implications. Statistics. Repercussion throughout the world, the Mediterranean and Spain.
2. Flammability and combustibility.	Heat transfer. Phases of combustion in case of fire. The temperature during forest fires.
3 forest fuels.	Typology. The physical-chemical behavior with influence in the world. Models of fuel.
4 Influence of meteorological and topographic factors on the spread of fire.	Relative humidity and temperature. Precipitation. Winds. Heat inversion. Electric storms. Atmospheric stability.
5 Variables of basic behavior of forest fires.	Empirical physical and empirical models of propagation. Prediction systems. The dynamics of high intensity fires. The factors they cause. Fires of glasses. Fires of points.
6 Fire Prevention.	Analysis of the causes. Determining sites. The educational legislation. Coercive work. The rates of fire hazard. Spanish system. Systems from America, Canada and Australia.
7 Preventive forestry. Activities related to forest fires.	Influence of problems in the planning of forest fires. Firewall and firewall areas. Preventive forestry techniques. Amendments arborea vegetation. Scrub fuel control techniques. The prescribed burning schedule. Ignition techniques. Execution. Evaluation.
8 Organization of a permanent fire protection structure.	Operations. Extinction techniques. Basic principles. Lines.Lineas control lines. Direct attack The indirect attack.
9. Hand tools and equipment for security personnel.	Means of aerial combat in it fires. Characteristics general types, advantages and use limitaci3ns.El auga.Retardantes: types, effects and applications.

10 Influence of forest fires on ecosystems.	Adaptations of vegetation fires. Fire regimes. Post-secondary world. Impact of fire on the ground. Erosive effects of forest fires. Change the fire hydrologicos.Repelencia after the infiltration of water. Changes in the PTO.
11 Restoration of burned areas.	Actions to control erosion. Revegetación: Techniques, spices, advantages and limitations

Planning

	Class hours	Hours outside the classroom	Total hours
Laboratory practical	10	20	30
Lecturing	30	30	60
Practices through ICT	6	6	12
Autonomous problem solving	2	20	22
Studies excursion	6	6	12
Problem and/or exercise solving	1	3	4
Problem and/or exercise solving	5	5	10

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

Methodologies

	Description
Laboratory practical	Resolution of practical cases by students with educational orientation and the use of specific laboratory of materials and equipment
Lecturing	Exposition of the content of the subject, the theoretical bases and / or guidelines for the realization of A work, the exercise or project to be developed by students
Practices through ICT	Practices in computer classrooms Present practice in computer rooms to solve practical assumptions of students with the orientation and use of specific programs and resources of the teaching team
Autonomous problem solving	Problem solving and / or autonomous problem solving exercises that students must solve in a personalized way outside the class throughout the course
Studies excursion	Practical exercise management tools and fire fighting equipment

All competences are type A, which they learn in all methodologies

Personalized assistance

Methodologies	Description
Laboratory practical	
Lecturing	
Practices through ICT	
Studies excursion	
Autonomous problem solving	
Tests	Description
Problem and/or exercise solving	
Problem and/or exercise solving	

Assessment

	Description	Qualification	Training and Learning Results
Autonomous problem solving	*Approach of problems that he student has to resolve of personalised form *out of class to *the wide of him course	40	C27 D7
Problem and/or exercise solving	*Approach of questions of *brief answer that he student has to resolve in class in him act of evaluation	40	C27
Problem and/or exercise solving	*Approach of problems that he student has to resolve in class in him act of evaluation	20	C27

Other comments on the Evaluation

All wools competitions are of type To *and evaluate * of conjoint *form **segun *the *procedures described previously.

Sources of information

Basic Bibliography

Juli G. Pausas, **¿QUÉ SABEMOS DE...? Incendios forestales**, CSIC e Catarata, 2012

Vega, J.A. e outros, **Acciones urgentes contra la erosión en áreas forestales quemadas. Guía para su planificación en Galicia. Xunta de Galicia**, 1, Fuegosred, 2013

Ricardo Vélez Muñoz, **LA DEFENSA CONTRA INCENDIOS FORESTALES. FUNDAMENTOS Y EXPERIENCIAS**, 5, MCGRAW-HILL, 2009

Stephen J. Pyne e outros, **Introduction to Wildland Fire: Fire Management in the United States**, 2, John Wiley & Sons Inc, 1996

Rego, F. C., Morgan, P., Fernandes, P., & Hoffman, C., **Fire science: from chemistry to landscape management**, Springer Nature, 2021

Complementary Bibliography

Arellano, S. e outros, **Foto-Guía de combustibles forestales de Galicia. Versión I**, 1, Andavira, 2016

J.A. Vega, **Manual de queimas prescritas para matogueiras de Galicia**, 1, CMA- Xunta de Galicia, 2001

Recommendations

Subjects that it is recommended to have taken before

Physics: Physics I/P03G370V01102

Physics: Physics II/P03G370V01202

Edaphology/P03G370V01302

Forestry/P03G370V01401

IDENTIFYING DATA				
Cellulose, pulp and paper				
Subject	Cellulose, pulp and paper			
Code	P03G370V01803			
Study programme	Grado en Ingeniería Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	2nd
Teaching language				
Department				
Coordinator				
Lecturers				
E-mail				

----- UNPUBLISHED TEACHING GUIDE -----

IDENTIFYING DATA**Quality control and prevention of occupational hazards in the forestry industry**

Subject	Quality control and prevention of occupational hazards in the forestry industry			
Code	P03G370V01804			
Study programme	Grado en Ingeniería Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	González Prieto, Óscar			
Lecturers	González Prieto, Óscar			
E-mail	oscargprieto@uvigo.es			
Web	http://www.forestales.uvigo.es			
General description	Introduction to the systems of quality control and management of jobs risks. Methods of continuous improvement.			

Training and Learning Results

Code	
C39	Ability to know, understand and use the principles of quality control in the forest industry.
C40	Ability to know, understand and use the principles of industrial safety and hygiene.
D5	Capacity for information management, analysis and synthesis
D8	Ability to solve problems, critical reasoning and decision making

Expected results from this subject

Expected results from this subject	Training and Learning Results
Ability to know, understand and use the principles of quality control in the forest industry.	C39
Ability to know, understand and use the principles of industrial safety and hygiene.	C40
Capacity for information management, analysis and synthesis	D5
Ability to solve problems, critical reasoning and decision making	D8

Contents

Topic	
1.- Forest industry and quality	1.1. General concepts
2.- General quality concepts	2.1 Definition of quality 2.2. Definition of Systems of quality 2.3.-Evolution of the systems of quality 2.4. Profits of the quality 2.5. Organisational model of the quality 2.6. Commitment of the direction 2.7. Human team
3.- Norms ISO 9001: 2008 and ISO 9004: 2009	3.1 Aims 3.2. Scope 3.3. Approach 3.4. Points of norm
4.- As implant a system of quality	4.1. Phases of the implantation of a system of management 4. 2. Process of the certification 4.3. Orientation to the management by processes 4.4. Management of the improvement of a process
5.- Audits of Quality	5.1. Definition of audit 5.2. Types of audit 5.3. Process of audit 5.4.Team of audit 5.5. Preparation of the audit 5.6. Development of the audit. 5.7. Report of audit
6.- The marked CE of wooden products for employment in the construction	6.1. Realisation of the marked CE of products. Phases of the process

7.- Foundation of the technicians of improvement of the conditions of work.	7.1.- Technical of prevention of labour risks. 7.2.- Norma and signaling in security. 7.3.- Collective and individual protection 7.4.- Plans of emergency and autoprotection. 7.5.- Toxic and dangerous waste 7.6.- Installations against forestry fire.
8.- Security in the work	8.1.- Accidents of Work 8.2.- Analysis and general evaluation of the risk of accident.
9.- Industrial hygiene.	9.1.- Concepts and aims. 9.2.- Normative legal specific. 9.3.- Physical agents; noise, vibrations 9.4.- Biological agents 9.5.- Medicine of the work: Pathologies of labour origin. 9.6.- first aid And first helps. 9.7.- Ergonomics and psicosocology

Planning

	Class hours	Hours outside the classroom	Total hours
Case studies	10	10	20
Studies excursion	4	2	6
Lecturing	30	66	96
Laboratory practical	4	0	4
Collaborative Learning	1	0	1
Problem and/or exercise solving	1	20	21
Objective questions exam	1	0	1
Essay questions exam	1	0	1

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

Methodologies

	Description
Case studies	Seminars of approach and resolution of practical cases with oral presentation
Studies excursion	Knowledge of the implantation of systems of quality in companies of transformation of the wood
Lecturing	Explanation Of theoric concepts and exemplifications
Laboratory practical	Use of basic tools for quality control.
Collaborative Learning	The tutorials will be carried out both in person or by telematic means (email, remote campus, doubt forums, Moovi). For those students who request it, they can be carried out, to the extent possible, outside the indicated hours. Both the hours and the place of the tutorials will be indicated at the beginning of the course through the officially established channels.

Personalized assistance

Methodologies	Description
Collaborative Learning	The tutorials will be carried out both in person or by telematic means (email, remote campus, doubt forums, Moovi). For those students who request it, they can be carried out, to the extent possible, outside the indicated hours. Both the hours and the place of the tutorials will be indicated at the beginning of the course through the officially established channels.

Assessment

	Description	Qualification	Training and Learning Results
Studies excursion	Real visits to industrial installations	5	C39 C40
Lecturing	Active participation in the class room	10	C39 C40
Laboratory practical	Assistance and active participation to practical sessions of handle of basic tools of control of quality	10	C39 C40 D5 D8
Problem and/or exercise solving	Preparation by heart of practices with basic tools of control of quality	15	C39 C40
Objective questions exam	Test of knowledge of the matter	30	C39 C40 D5 D8
Essay questions exam	Test of the knowledge of the matter	30	C39 C40 D5 D8

Other comments on the Evaluation

Exam calendar: according to official information from the School of Forest Engineering (check the official website for updated information)

Evaluation in continuous evaluation modality; Master class: 10%, Laboratory Practices: 10%, Theoretical content exam: 30%, Objective theoretical content exam: 30%, Practical memory delivery: 15%, Exit and memory delivery: 5%.

Evaluation in global evaluation modality; Theoretical content exam: 35%, Theoretical/practical content exam: 35%; Alternate memory: 30%.

Sources of information

Basic Bibliography

Dale H. Besterfield, **Control de calidad**, 978-607-442-121-7, Pearson Educación, 2009

Complementary Bibliography

Cuatrecasas Arbós, Lluís, **Gestión integral de la calidad : implantación, control y certificación**, 84-8088-282-4, Gestión 2000, 1999

Armero Fernández, Lucía, **Manual de prevención de riesgos laborales**, 978-84-18330-02-5, 2020

Igartua Miró, María Teresa, **Sistema de prevención de riesgos laborales**, 978-84-309-7967-7, Tecnos, 2020, 2020

Cassini Gómez de Cádiz, Javier, **Guía práctica en prevención de riesgos laborales : una aproximación desde la experiencia**, 978-84-1390-560-0, Editorial Aranzadi, S.A.U., 2021

Baquero Serrano, Carmen, **Manual básico de prevención de riesgos laborales**, 978-84-4543-925-8, Centro de Estudios Financieros, 2019, 2019

Recommendations

Subjects that continue the syllabus

Environmental Engineering/P03G370V01609

Subjects that are recommended to be taken simultaneously

Primary wood processing industries/P03G370V01706

Other comments

Optional subject for dual training projects as was established by the memory of the degree.

IDENTIFYING DATA**Chemical industries of the wood, cellulose, pulp and paper**

Subject	Chemical industries of the wood, cellulose, pulp and paper			
Code	P03G370V01805			
Study programme	Grado en Ingeniería Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	2nd
Teaching language	#EnglishFriendly Spanish Galician			
Department				
Coordinator	Sánchez Bermúdez, Ángel Manuel			
Lecturers	Sánchez Bermúdez, Ángel Manuel			
E-mail	asanchez@uvigo.gal			
Web	http://eqea.uvigo.es/			
General description				

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.
B11	Ability to characterize the anatomical and technological properties of wood and non-timber forest raw materials, as well as the technologies and industries of these raw materials.
C37	Knowledge of the basic principles of the chemical transformation of wood and its industrial processes, in particular cellulose and paper.
D2	Ability to communicate orally and written in Spanish or in English
D5	Capacity for information management, analysis and synthesis
D10	Autonomous Learning

Expected results from this subject

Expected results from this subject	Training and Learning Results		
1. Knowledge and understanding of wood engineering to the necessary level to complain the rest of the competitions of the degree, including notions of the last advances.	B1 B11	C37	D2 D5 D10
2. Capacity to analyze products, processes, and complex systems in his field of study; choose and apply analytical methods, calculations, and experimental notable of notable form and interpret properly the results of these analyses.			
3. Capacity to project, design, and develop chemical processes oriented to the obtaining of products of the forest biomass. Capacity to make bibliographic research, consult and use databases and other sources of information.			
4. Capacity *ydiseñar experiments, interpret results, and obtain conclusions in his field of study.			
5. Practical competition to resolve complex problems, make complex projects of engineering and make specific investigations for his specialty.			
6. Knowledge of separation methods and the unit operations in chemical engineering, teams and tools, technological processes, and of wood engineering and his limitations in the field.			
7. Capacity to apply norms of engineering in his specialty.			

Contents

Topic	
Unit operations and Transport Phenomena.	Matter Transfer Based Unit Operations. Heat Transmission Based Unit Operations. Simultaneous Heat and Matter Transfer based Unit Operations. Operations with solids Extensive and Intensive Properties. Definitions and relations. Similarities and differences between the transport of extensive properties. Molecular and turbulent transport. Material and Energy Balances.

2. Chemical composition of the wood. Possibilities of obtaining of products of this biomass.	Cellulose: Presence, Structure, and Properties of the molecule. Polymorphism, supramolecular structure, microfibers, and macro fibers. Hemicellulose: Classification and definitions. Basic units of construction. Chemical Structure of mananes, xylanes, galactanes and glucanes. Content in Hard and Soft Wood. Pectins: Definitions, Structural Units, Chemical Composition. Homogalacturonane and ramnogalacturonane. Lignin: presence, structural units and training of macromolecules of lignin, complex lignin-polysaccharide. *Suberina: Presence in the wood and other fabrics of the trees, chemical structure and function. Wooden extracts: occurrence, definitions, systematic; *terpenos and *terpenoides, *extractivos phenolic, fats, waxes, sour *grasos and *esteroles of soft and hard wood. Tannins of soft and hard wood. Inorganic constituents.
3. Wood Products	Chemical pathways for the integral valorization of wood. Cellulose, and Hemicellulose Derived Products. Wood Polysaccharides and their Applications. Other Valorizable Components of Wood.
4. Paper Pulp and cardboard. Study of Specific Processes of the obtaining Paper Pulp and its Derivatives.	Chemical processes, semi-chemical, mechanical, thermomechanical, and paper recovery. Prime matters. Properties of Fibers. Forest Feedstocks, Seasonal Vegetables, Waste Cellulosics, and Paper Recovery. The process of production of Pulp. Unit Operations. Digestion, Bleaching, Disintegration, Purification, Refining.
5. Biorrefinerías	Bioenergy, Carbon Cycle and CO2 Captture. Basic Concepts about biorefineries: biofuels, bioproducts, and other materials. Microalgae Biorefineries.
6. Energy Valorization of Wood	Legislation and Energetic and Environmental Policy. Vegetal Biomass and Energy. Biofuels. Biogas and Waste Management.

Planning			
	Class hours	Hours outside the classroom	Total hours
Lecturing	15	0	15
Laboratory practical	21	24	45
Case studies	15	15	30
Problem solving	0	10	10
Mentored work	0	50	50
*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.			

Methodologies	
	Description
Lecturing	Descriptive Lectures ching about the necessary concepts to solve the problems and the Cases of Study.
Laboratory practical	Experiments are conducted in the laboratory. The evaluation of the Student's Work will be done from his attitude and competition in the laboratory as well as the report in some format requested: experiment report, poster, scientific article, or presentation.
Case studies	Students must present some cases of study and will make all the numerical calculations and simulations related to their realization.
Problem solving	Students will solve problems in an autonomous way involving concepts treated in the masterclasses and the studies of cases and practices.
Mentored work	students have to perform a mentored preparation of a project related to: - Simulation of a process. - Modelling. - Laboratory Experiment. That has to document in a suitable form.

Personalized assistance	
Methodologies	Description

Lecturing	Follow-up by Platform of and e-Learning. Publication of tutorials, presentations, and specific bibliography in MOOVI. Personalized mentoring both face-to-face and online.
Laboratory practical	Students will find published guides, in MOOVI, for the realization of the laboratory experiments. They have to do some tasks related to: preparation, experiments calculations, and data processing as well as the corresponding report in the required format, as homework.
Case studies	Practical Case Studies shall be proposed to students to be solved with data and expertise obtained from lectures. That supply him with the professor. These practical cases should be delivered as Moodle tasks in MOOVI.

Assessment				
	Description	Qualification	Training and Learning Results	
Lecturing	When being fundamentally descriptive the knowledges poured in the lectures will not be directly evaluate.	10	B1 B11	C37
Laboratory practical	Laboratory experiments will performed from which, at least three, go to avaluation. The rubric of the score for each delivery format will publish in MOOVI.	20	B11	C37
Problem solving	Problems ara a part of the exame and/or partial proofs realized during the class time. Also in form of deliverables in MOOVI. The grading will e done by the use of rubricsl published in MOOVI.	30		D2 D5
Mentored work	The work end of subject is a laboratory experimelt, or simulation, or mixed, and have to be delivered in a report format. Rubric for grading wil be published in MOOVI.	40		

Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

Eero Sjöström, **Wood Chemistry Fundamentals and Applications**, 2, ACADEMIC PRESS, INC., 1993

Tanja Wüstenberg, **Cellulose and Cellulose Derivatives**, 1, WILEY-VCH, 2013

Gunnar Henriksson, **Pulp and Paper Chemistry and Technology**, 1, Monica Ek, 2009

Many, **Biorefinery: From Biomass to Chemicals and Fuels**, 1, Michele Aresta, 2021

Many, **Cellulose Science and Technology**, Wiley, 2018

Deepansh Sharma, Anita Saini, **Lignocellulosic Ethanol Production from a Biorefinery Perspective**, 1, Springer, 2020

Recommendations

Subjects that continue the syllabus

Final Year Dissertation/P03G370V01991

Subjects that are recommended to be taken simultaneously

Cellulose, pulp and paper/P03G370V01803

Subjects that it is recommended to have taken before

Chemistry: Chemistry/P03G370V01204

Other comments

Eligible matter for dual training projects as established by the memory of the degree.

IDENTIFYING DATA				
Prácticas externas: Prácticas en empresas				
Subject	Prácticas externas: Prácticas en empresas			
Code	P03G370V01981			
Study programme	Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4	An
Teaching language	Castelán Galego			
Department				
Coordinator	Picos Martín, Juan			
Lecturers	Picos Martín, Juan			
E-mail	jpicos@uvigo.es			
Web	http://http://transferencia.uvigo.es/transferencia_gl/practicas/			
General description	http://transferencia.uvigo.es/opencms/export/sites/transferencia/transferencia_gl/documentos/instrucion_curriculares.pdf			

Resultados de Formación e Aprendizaxe

Code	
C41	Capacidade para a realización das tarefas profesionais propias da titulación no campo do traballo individual e en equipo, aplicando, según sexa a práctica en cuestión, algunha/s das técnicas e aptitudes que, a modo de exemplo e sen ser excluíntes, se citan na memoria de verificación.

Resultados previstos na materia

Expected results from this subject	Training and Learning Results
6R. 2018 Capacidade para proxectar, deseñar e desenvolver produtos complexos (pezas, compoñentes, produtos acabados, etc.), procesos e sistemas da súa especialidade, que cumpran os requisitos establecidos, incluíndo o coñecemento dos aspectos sociais, de saúde e seguridade ambiental, económico e industrial; así como seleccionar e aplicar métodos de proxecto apropiados.	C41
7R. 2018 Capacidade do proxecto utilizando algúns coñecementos avanzados da súa especialidade en enxeñaría.	
9R. 2018 Capacidade para consultar e aplicar códigos de boas prácticas e seguridade da súa especialidade.	
11R. 2018 Comprensión das técnicas e métodos de análise, proxecto e investigación aplicables e as súas limitacións no ámbito da súa especialidade.	
12R. 2018 Competencia práctica para resolver problemas complexos, realizar proxectos complexos de enxeñaría e realizar investigacións específicas para a súa especialidade.	
13R. 2018 Coñecemento da aplicación de materiais, equipos e ferramentas, procesos tecnolóxicos e de enxeñaría e as súas limitacións no ámbito da súa especialidade.	
14R. 2018 Capacidade para aplicar normas de enxeñaría na súa especialidade.	
15R. 2018 Coñecemento das implicacións sociais, de saúde e seguridade, ambientais, económicas e industriais da práctica en enxeñaría.	
16R. 2018 Ideas xerais sobre cuestións económicas, organizativas e de xestión (como xestión de proxectos, xestión de riscos e cambio) no contexto industrial e empresarial.	
17R. 2018 Capacidade para recoller e interpretar datos e manexar conceptos complexos dentro da súa especialidade, para emitir xuízos que impliquen unha reflexión sobre cuestións éticas e sociais	
18R. 2018 Capacidade para xestionar actividades ou proxectos técnicos ou profesionais complexos da súa especialidade, asumindo a responsabilidade da toma de decisións.	
19R. 2018 Capacidade para comunicar de xeito eficaz información, ideas, problemas e solucións no campo da enxeñaría e coa sociedade en xeral.	
20R. 2018 Capacidade para funcionar eficazmente en contextos nacionais e internacionais, individualmente e en equipo, e cooperar cos enxeñeiros e persoas doutras disciplinas.	
21R. 2018 Capacidade para recoñecer a necesidade dunha formación continua e realizar esta actividade de xeito independente durante a súa vida profesional.	

Contidos

Topic

Os contidos das prácticas serán expostos en cada Desenvolverse en calquera actividade práctica relacionada co grao en caso particular pola Escola de Enxeñaría Forestal entidades que teñan asinado un Convenio de Cooperación Educativa e a organización que acolle o alumno e atenderán á adquisición por parte do alumno practicante dalgunha/s das competencias xerais e específicas relacionadas nesta descrición de materia.

Actividade profesional do alumno tutelada pola Poñeranse en práctica as competencias adquiridas no grao respectiva organización que ofrezca a práctica.

Planificación

	Class hours	Hours outside the classroom	Total hours
Prácticum, Practicas externas e clínicas	0	145	145
Seminario	5	0	5

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

Metodoloxía docente

	Description
Prácticum, Practicas externas e clínicas	Os contidos das prácticas serán expostos en cada caso particular pola Escola de Enxeñaría Forestal e a organización que proponse á práctica e atenderán á adquisición por parte do alumno practicante dalgunha/s das competencias xerais e específicas relacionadas nesta descrición de materia.
Seminario	

Atención personalizada

Methodologies	Description
Prácticum, Practicas externas e clínicas	O alumno terá un titor no centro e un na empresa

Avaliación

	DescriptionQualification	Training and Learning Results
Prácticum, Practicas externas e clínicas	100	C41

Other comments on the Evaluation

A avaliación positiva da realización da práctica terá lugar sobre a base dun informe favorable emitido pola organización de acollida do alumno practicante. En todo caso o alumno deberá presentar á Dirección da Escola de Enxeñaría Forestal unha memoria resumen da práctica realizada

Bibliografía. Fontes de información

Basic Bibliography

Complementary Bibliography

Recomendacións

Other comments

A competencia fixa traballada é a CE41, á parte desta o titor marcará as outras competencias traballadas que dependerán das prácticas realizadas e poderán estar no grupo das xerais, transversais e específicas.

COMPETENCIAS XERAIS: CG1-CG14

COMPETENCIAS TRANSVERSAIS: CT1-CT10

COMPETENCIAS ESPECÍFICAS: CE1-CE40

Materia Eleixible para proxectos de formación dual segundo o establecido pola memoria da titulación.

IDENTIFYING DATA				
Final Year Dissertation				
Subject	Final Year Dissertation			
Code	P03G370V01991			
Study programme	Grado en Ingeniería Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	12	Mandatory	4th	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	Valero Gutiérrez del Olmo, Enrique María			
Lecturers	Picos Martín, Juan Valero Gutiérrez del Olmo, Enrique María			
E-mail	evalero@uvigo.gal			
Web	http://www.forestales.uvigo.es/sites/default/files/Reg%20TFG%20Enx%20Forestal%20APROBADO%20comisi%C3%B3n%20Permanente%207_3_13.pdf			
General description	The Final Dissertation (FD) is a personal and original work that each student has to elaborate under supervision, and is meant to show an integrated achievement of the knowledge and competences associated to the studies. 1) Ability to develop the methodology of a project and formulate a plan of work related with any of the fields of the Forestry / Forestry Engineering; 2) Ability to execute the work projected; 3) Ability to present and defend publicly the FD The Academic Commission of the Faculty is the body in charge of approving the assignments and to program the FD defense			

Training and Learning Results	
Code	
A1	That students possess and understand knowledge that provides a basis or opportunity to be original in the development and / or application of ideas, often in a research context
A2	That students know how to apply acquired knowledge and their capacity to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study
A3	That students are able to integrate knowledge and face the complexity of making judgments based on information that, being incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their knowledge and judgments
A4	That the students know how to communicate their conclusions -and the knowledge and ultimate reasons that sustain them- to specialized and non-specialized audiences in a clear and unambiguous way
A5	That students have the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous.

Expected results from this subject	
Expected results from this subject	Training and Learning Results

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.

12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop 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.

16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context.

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

19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general.

21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life.

Contents

Topic

The student will have to present in the term of 15 Said proposal will have to include like minimum: skillful days from dates it of ending of the term of

- enrollment corresponding to the second semester)
- a) An explanatory memory of the project that pretends realise, that include Title, antecedents, justification of the need that tries cover or solution to the problem posed, aims, technology to employ and results expected.
- b) Methods, systems or mechanical tools, electronic the computer, material, machinery or other resources, foreseen in the realisation of the TFG.
- c) In its case, graphic or cartographic support of the place where pretends realise the TFG.
- d) Time estimated or schedule for the realisation of the TFG.
- e) Proposal of Tutor

Planning

	Class hours	Hours outside the classroom	Total hours
Mentored work	0	299	299
Seminars	15	0	15
Project	0	1	1

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

Methodologies

	Description
Mentored work	See Regulation TFG
Seminars	

Personalized assistance		
Methodologies	Description	
Mentored work	PhD thesis development	

Assessment		
Description	Qualification	Training and Learning Results
ProjectDevelopment and exposition of PhD thesis	100	A1
		A2
		A3
		A4
		A5

Other comments on the Evaluation

Sources of information
Basic Bibliography
Complementary Bibliography

Recommendations