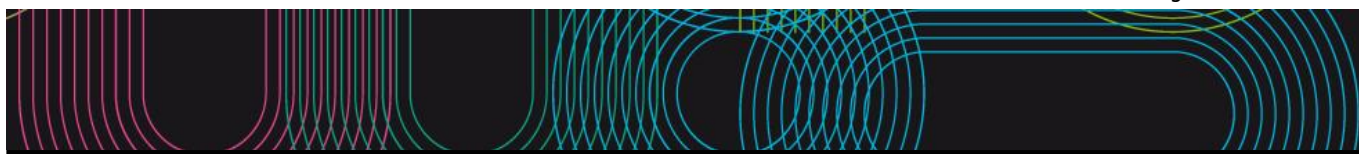




TABLA DE ERROS	
Lugar do erro	Descrición
Apartado de titulación 'Address'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 223]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=32&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Address'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 231]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=32&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Address'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 223]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=31&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Address'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 231]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=31&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Additional information'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 223]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=36&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Additional information'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 231]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=36&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Additional information'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 223]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=34&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Additional information'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 231]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=34&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
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## (\*)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](mailto:sdeuetf@uvigo.es)
7. Web: <http://www.forestales.uvigo.es>



### Faculty Management

#### Managerial team:

Director: D. Enrique Valero Gutiérrez del Olmo

Deputy director: D<sup>a</sup>. Angeles Cancela Carral

Secretary: D. Juan Picos Martín

#### Governing bodies:

- Faculty Assembly

- Commissions:

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

#### Departments in the Centre:

**(\*)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](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
<b>SUMA</b>	<b>813</b>	<b>438</b>

**Laboratorios e talleres:**

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

2º	Lab. Enxeñaría Eléctrica	110,73 m <sup>2</sup>	21	NO	NO
2º	Lab. Enxeñaría Química	109,98 m <sup>2</sup>	15	27,40 m <sup>2</sup>	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)

[http://www.uvigo.es/uvigo\\_gl/administración/servicioalumnado](http://www.uvigo.es/uvigo_gl/administración/servicioalumnado)

<http://extension.uvigo.es>

[http://webs.uvigo.es/vicoap/normativa\\_oa.gl.htm](http://webs.uvigo.es/vicoap/normativa_oa.gl.htm)

[http://www.uvigo.es/uvigo\\_gl/estudiotitulaciones](http://www.uvigo.es/uvigo_gl/estudiotitulaciones)

[http://www.uvigo.es/uvigo\\_gl/vidauniversitaria/calendarioescolar](http://www.uvigo.es/uvigo_gl/vidauniversitaria/calendarioescolar)

[http://www.uvigo.es/uvigo\\_gl/vidauniversitaria/universidadvirtual](http://www.uvigo.es/uvigo_gl/vidauniversitaria/universidadvirtual)

[http://secxeral.uvigo.es/secxeral\\_gl/normativa/normativauniversidad/estudaintes/regulamento\\_estudiantes.html](http://secxeral.uvigo.es/secxeral_gl/normativa/normativauniversidad/estudaintes/regulamento_estudiantes.html)

[http://www.uvigo.es/uvigo\\_gl/vidauniversitaria/normativa](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/](http://www.uvigo.es/uvigo_gl/vidauniversitaria/salud/centromedico/)
- **Employment Office :** <http://emprego.uvigo.es/>
- **Canteens and accommodation:** [http://www.uvigo.es/uvigo\\_gl/vidauniversitaria/comedores\\_aloxamento/](http://www.uvigo.es/uvigo_gl/vidauniversitaria/comedores_aloxamento/)
- **Other activities:**
  - [http://www.campuspontevedra.uvigo.es/index.php?\\*id=14](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/>

## (\* ) Grao en Enxeñaría Forestal

### Subjects

**Year 4th**

Code	Name	Quadmester	Total Cr.
P03G370V01701	Planificación física e ordenación territorial	1st	6
P03G370V01702	Xestión de caza e pesca	1st	6
P03G370V01703	Patoloxía e pragas forestais	1st	6
P03G370V01704	Silvopascicultura	1st	6
P03G370V01705	Tecnoloxía do secado e conservación de madeiras	1st	6
P03G370V01706	Industrias de primeira transformación da madeira	1st	6
P03G370V01707	Organización industrial e procesos na industria da madeira	1st	6
P03G370V01708	Innovación e desenvolvemento de produtos na industria da madeira	1st	6
P03G370V01709	Innovación e desenvolvemento de produtos na industria forestal	1st	6
P03G370V01801	Xestión de espazos protexidos e biodiversidade	2nd	6
P03G370V01802	Incendios forestais	2nd	6
P03G370V01803	Celulosa, pasta e papel	2nd	6
P03G370V01804	Control de calidade e prevención de riscos laborais na industria forestal	2nd	6
P03G370V01805	Industrias químicas da madeira, celulosa, pasta e papel	2nd	6
P03G370V01981	Prácticas externas: Prácticas en empresas	2nd	6
P03G370V01991	Traballo de Fin de Grao	2nd	12

**IDENTIFYING DATA****Physical planning and land management**

Subject	Physical planning and land management			
Code	P03G370V01701			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish Galician			
Department				
Coordinator	Valero Gutiérrez del Olmo, Enrique María			
Lecturers	Álvarez Bermúdez, Xana Valero Gutiérrez del Olmo, Enrique María			
E-mail	evalero@uvigo.es			
Web				
General description				

**Competencies**

Code		Typology
CG1	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.	
CG2	Ability to analyze the ecological structure and function of forest systems and resources, including landscapes.	
CG10	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.	
CE32	Ability to know, understand and use the principles of: planning and planning of the territory. Forest landscaping.	• know • Know How
CT4	Sustainability and environmental commitment	• know
CT5	Capacity for information management, analysis and synthesis	• Know How
CT6	Organization and planning capacity	• Know How
CT7	Skill in the use of IT tools and ICTs.	• Know How
CT8	Ability to solve problems, critical reasoning and decision making	• Know be
CT9	Teamwork skills, skills in interpersonal relationships and leadership.	• Know be
CT10	Autonomous Learning	

**Learning outcomes**

Learning outcomes	Competences
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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.	CG1 CG2 CG10
3R. 2018 Be conscious of the multidisciplinary context of the engineering.	CE32
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.	CT4 CT5 CT6
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.	CT7 CT8 CT9
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.	CT10
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	<ul style="list-style-type: none"> <li>Concept of Physical Planning.</li> <li>Physical Planning in Engineering</li> <li>Background of Physical Planning</li> <li>Environmental and integrated inventories</li> <li>Evolution of Physical Planning studies</li> <li>Definitions of Physical Planning</li> <li>Ecologically based physical planning</li> </ul>
Topic II: PHYSICAL PLANNING PROCESS	<ul style="list-style-type: none"> <li>Typology and Purposes of Planning</li> <li>Operational techniques</li> <li>Levels of application</li> <li>Fundamental relationships</li> <li>General scheme</li> <li>Definition of objectives</li> <li>Inventory</li> <li>Modeling</li> <li>Spatial classification</li> <li>Choice of Alternatives</li> <li>Decision making</li> <li>Contrast of Planning</li> <li>Planning follow-up</li> </ul>
Topic III: THE TOOLS FOR PHYSICAL PLANNING	<ul style="list-style-type: none"> <li>Introduction to Geographic Information Systems.</li> <li>The S.I.G. Applied to Physical Planning and Territorial Planning.</li> </ul>

## Planning

	Class hours	Hours outside the classroom	Total hours
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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	

### Assessment

	Description	Qualification	Evaluated Competences
Mentored work	(*)	30	
Presentation	(*)	70	

### Other comments on the Evaluation

### Sources of information

#### Basic Bibliography

#### Complementary Bibliography

### Recommendations



<b>IDENTIFYING DATA</b>				
<b>Hunting and fishing management</b>				
Subject	Hunting and fishing management			
Code	P03G370V01702			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish Galician			
Department				
Coordinator	Valero Gutiérrez del Olmo, Enrique María			
Lecturers	Valero Gutiérrez del Olmo, Enrique María			
E-mail	evalero@uvigo.es			
Web	<a href="http://http://faitic.uvigo.es/index.php/es/">http://http://faitic.uvigo.es/index.php/es/</a>			
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 cinxéticos e piscícolas			

<b>Competencies</b>		
Code		Typology
CG8	Ability to manage and protect forest fauna populations, with special emphasis on hunting and fish populations.	
CE33	Ability to know, understand and use the principles of: hunting and fishing management. Aquaculture systems.	<ul style="list-style-type: none"> <li>• know</li> <li>• Know How</li> </ul>
CT4	Sustainability and environmental commitment	
CT5	Capacity for information management, analysis and synthesis	<ul style="list-style-type: none"> <li>• Know How</li> </ul>
CT6	Organization and planning capacity	<ul style="list-style-type: none"> <li>• Know How</li> </ul>
CT8	Ability to solve problems, critical reasoning and decision making	<ul style="list-style-type: none"> <li>• Know be</li> </ul>

<b>Learning outcomes</b>	
Learning outcomes	Competences

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.	CG8 CE33 CT4
3R. 2018 Be conscious of the multidisciplinary context of the engineering.	CT5
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.	CT6 CT8
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.	
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
Autonomous 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	(*)Impartiránse leccións en clase dos temas de desenvolvemento
Studies excursion	(*)Organizaránse saídas de campo relacionadas coa materia, que posteriormente serán avaliadas cun informe das prácticas realizadas.
Autonomous practices through ICT	It will be the development of the subject through the new ICT known as tele-training or e-learning, not limited to mere written expositions, but making them of a sharply participatory nature with the development of animations and simulations, in complex situations, that oblige the Student to interact with the subject matter. All the competences are treated and developed in the autonomous practical sessions through ICT as well as in the master sessions and the field trips.

### Personalized assistance

Methodologies	Description
Autonomous practices through ICT	
Tests	Description
Objective questions exam	

### Assessment

	Description	Qualification	Evaluated Competences
Autonomous practices through ICT	(*)Avaliaránse as saídas de campo (20%) e as probas a través de TIC (40%)	60	
Objective questions exam	(*)Diferentes preguntas sobre a materia vista nas sesións maxistras así como nas prácticas realizadas.	40	

### Other comments on the Evaluation

### Sources of information

#### Basic Bibliography

#### Complementary Bibliography

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- DOADRIO, I., B. ELVIRA y. Y. BERNAT, Peces continentales españoles. Inventario y clasificación de zonas fluviales, 1991, Ministerio de Agricultura, Pesca y Alimentación
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- AUDEBERT, Tristan (Henri Béraud), La caza de la becada, 1997, Ed. Clan, Bilbao
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- BOZA, Moisés D, El trampeo y demás artes de caza tradicionales en la península Ibérica., 2003, Ed. Clan, Barcelona

### Recommendations

#### Subjects that continue the syllabus

Projects/P03G370V01503

Physical planning and land management/P03G370V01701

**Subjects that are recommended to be taken simultaneously**

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Forest Ecology/P03G370V01402

Use of forests/P03G370V01601

Forestry hydrology/P03G370V01604

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**Subjects that it is recommended to have taken before**

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Hydraulics/P03G370V01404

Forest entomology and Zoology/P03G370V01305

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**IDENTIFYING DATA****Pathology and forest pests**

Subject	Pathology and forest pests			
Code	P03G370V01703			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish Galician			
Department				
Coordinator	López de Silanes Vázquez, María Eugenia			
Lecturers	López de Silanes Vázquez, María Eugenia			
E-mail	esilanes@uvigo.es			
Web	<a href="http://http://webs.uvigo/esilanes/index.htm">http://http://webs.uvigo/esilanes/index.htm</a>			
General description	(*)Comprender e aprender os conceptos básicos e a terminoloxía específica, para coñecer e diferenciar as enfermidades e pragas máis importantes, resaltando as que afectan ao ámbito forestal do noso territorio			

**Competencies**

Code	Typology
CG1 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.	• know
CG3 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 .	
CE34 Ability to know, understand and use the principles of: forest diseases and pests.	• know • Know How
CT4 Sustainability and environmental commitment	
CT7 Skill in the use of IT tools and ICTs.	
CT8 Ability to solve problems, critical reasoning and decision making	

**Learning outcomes**

Learning outcomes	Competences
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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.	CG1 CG3 CE34
3R. 2018 Be conscious of the multidisciplinary context of the engineering.	CT4
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.	CT7 CT8
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.	

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## 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 ( <i>Mycosphaerella pini</i> and <i>M. dearnessii</i> )
	9.2 Blight of pine needles ( <i>Lophodermium pinastri</i> ).
	9.3 Mention of <i>Meloderma desmazieri</i>

Topic 10. Diseases of leaves in angiosperms	10.1 Oidium or odium of the oak, <i>Erysiphe alphitoides</i> .
	10.2 Spotting of eucalyptus leaves, <i>Mycosphaerella</i> sp.
	10.3 Gray mold, <i>Botryotinia fuckeliana</i> = <i>Botrytis cinerea</i>

Topic 11. Diseases of trunk and branches of conifers.	11.1 Cancers: <i>Sphaerosopsis sapinea</i> = <i>Granulodiplodia sapinea</i> ; <i>Nectria cinnabarina</i> = <i>Tubercularia vulgaris</i> .
	11.2 Royas: <i>Cronartium flaccidum</i> or white rust of pine.
	11.3 Resinous pineal cancer <i>Gibberella circinata</i> = <i>Fusarium circinatum</i> .

Topic 12. Diseases of trunk and branches in Angiosperms.	12.1 Chestnut brown, <i>Cryphonectria parasitica</i> . 12.2 Carbon or carbonaceous disease, <i>Biscogniauxia mediterranea</i> = <i>Hypoxylon mediterraneum</i> . 12.3 Grafiosis of elm. <i>Ophiostoma ulmi</i> , <i>O. novo-ulmi</i>
Topic 13. Root diseases.	13.1 Chestnut ink, <i>Phytophthora cinnamomi</i> . 13.2 In conifers, <i>Heterobasidion annosum</i> . 13.3 Pathogen of numerous species. <i>Armillaria</i> sp.
Topic 14. Diseases caused by nematode viruses and bacteria.	14.1 Pine wood nematode, <i>Bursaphelenchus xylophilus</i>
Topic 15. General ideas about insects. Classification: Apterygota. Exopterygota. Endopterygota.	
Topic 16. Biological balance and plague phenomenon.	
Topic 17. Methods of pest control.	
Topic 18. Conifer pests	18.1 Defoliator insects: <i>Thaumetopoea pityocampa</i> . 18.2 Insect borers, most representative species: scythes ( <i>Ips sexdentatus</i> ) cerambícidos ( <i>Monochamus galloprovincialis</i> ), etc. 18.3 Most representative taxa of sucking insects.
Topic 19. Eucalyptus pests.	19.1 Defoliating 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

## Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	30	70	100
Laboratory practical	20	20	40
Studies excursion	10	0	10

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

## Methodologies

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

## Personalized assistance

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

## Assessment

	Description	Qualification	Evaluated Competences
Laboratory practical	(*)Avaliación continua das actividades desenvolvidas nas prácticas, así como da memoria ou entrega de exemplares de patoloxía de plantas e/ou un exame práctico que o alumnado deben realizar ao final do curso.	30	CE34

Lecturing	(*)Exame escrito.- O alumnado debe responder a diferentes cuestións para demostrar os seus coñecementos sobre conceptos teóricos e cuestións prácticas da materia. Constará de preguntas de reposta curta e outras de reposta longa. Exposición por parte do alumnado dun dos temas do programa.	70	CG1 CE34
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### Other comments on the Evaluation

Exam dates

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

Second Call: June 25, 2020 12:00 Hours

### Sources of information

#### Basic Bibliography

#### Complementary Bibliography

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ANDRÉS, M. FE DE, Patógenos de plantas descritos en España., Ministerio de Agricultura, Pesca y Alimentación., 2000

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JARVIS W.R, Control de las enfermedades en cultivos de invernadero, Mundi-Prensa, 1998

LIÑÁN, C, Vademecum de productos fitosanitarios y nutricionales., Mundi Prensa, 2000-2014

Lombardero M.J. & Fernández de Ana F.J., A Procesionaria do piñeiro en Galicia., Consellería de Agricultura, Gandería e Montes., Xunta de Galicia, 1995

MALOY O.C. & MURRAY T.D. (eds), Encyclopedia of plant pathology, New York, [etc.] : John Wiley, 2000

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., 2000

MUÑOZ LÓPEZ C., PÉREZ FORTEA V., COBOS SUÁREZ P., HERNÁNDEZ ALONSO R., SÁNCHEZ PEÑA G, Sanidad forestal: guía en imágenes de plagas, enfermedades y otros agentes presentes en los montes, Mundi-Prensa 3ª ed, 2011

ROMANYK, N. & CADAHIA, D., Plagas de insectos en las masas forestales, Mundi-Prensa, 2002

TAINTER, F.H. & BAKER, F.A, Principles of forest pathology, John Wiley & Sons, 1996

TORRES JUAN, J., Patología Forestal.Principales enfermedades de nuestras especies forestales, Mundi Prensa., 1993

VILLALVA, S., Plagas y enfermedades de jardines, 2ª Ed. Mundi-Prensa, 2005

<http://www.infoagro.com/agrovademecum/>, Agrovademecum, 2017

ZÚBRIK M., KUNCA A. & CSÓKA G. (Eds.), Insects and Diseases damaging trees and shrubs of Europe, NAP Editions, 2013

Robert N. Trigiano, Mark T. Windham, Alan S. Windham (Eds.), Plant pathology concepts and laboratory exercises, Boca Raton (Florida): CRC., 2008

Remacha-Gete, A., Agentes Bioticos que atacan la madera. Ciclo biológico, tipo de ataque y control del mismo, AITiM. Madrid, 1989

<http://www.efa-dip.org/es/Publicaciones/FTecnicas/FichaListaTIPO.htm>, Índice de Fichas Técnicas disponibles en la Estación Fitopatológica, Diputación de Pontevedra, varios años según ficha

### Recommendations

#### Subjects that it is recommended to have taken before

Biology: Plant Biology/P03G370V01201

Botany/P03G370V01303

Forest Ecology/P03G370V01402

Forestry/P03G370V01401

Forest entomology and Zoology/P03G370V01305



**IDENTIFYING DATA****Forest and pasture management**

Subject	Forest and pasture management			
Code	P03G370V01704			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish Galician			
Department				
Coordinator	Valero Gutiérrez del Olmo, Enrique María			
Lecturers	Valero Gutiérrez del Olmo, Enrique María			
E-mail	evalero@uvigo.es			
Web	<a href="http://http://webs.uvigo.es/mchamorro/">http://http://webs.uvigo.es/mchamorro/</a>			
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			

**Competencies**

Code	Typology
CG1 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.	<ul style="list-style-type: none"> <li>• know</li> <li>• Know How</li> </ul>
CG11 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.	
CE8 Knowledge of the bases and biological foundations of the plant field in engineering.	<ul style="list-style-type: none"> <li>• know</li> </ul>
CE15 Ability to know, understand and use the principles of: forest botany.	<ul style="list-style-type: none"> <li>• know</li> <li>• Know How</li> </ul>
CE17 Ability to know, understand and use the principles of silviculture.	<ul style="list-style-type: none"> <li>• know</li> <li>• Know How</li> </ul>
CE27 Ability to know, understand and use the principles of: prevention and fight against forest fires.	<ul style="list-style-type: none"> <li>• know</li> <li>• Know How</li> </ul>
CE35 Ability to know, understand and use the principles of: pasciculture and agroforestry systems.	<ul style="list-style-type: none"> <li>• know</li> <li>• Know How</li> </ul>
CT5 Capacity for information management, analysis and synthesis	
CT6 Organization and planning capacity	
CT8 Ability to solve problems, critical reasoning and decision making	

**Learning outcomes**

Learning outcomes	Competences
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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.	CG1 CG11 CE8
3R. 2018 Be conscious of the multidisciplinary context of the engineering.	CE15
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.	CE17 CE27 CE35
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.	CT5 CT6 CT8
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	
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.	

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## 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. Bromatoloxico 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.

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**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
Practices report	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	
Mentored work	
Studies excursion	
Tests	Description
Objective questions exam	

**Assessment**

	Description	Qualification	Evaluated Competences
Lecturing	(*) (*) Reconocimiento de especies pascícolas	10	
Mentored work	(*)(*) Confeción dun Herbario	10	
Studies excursion	(*)(*) Reconocimiento e identificación en campo de especies de interese pascícola	10	
Objective questions exam	(*)Recoñecer os coñecementos adquiridos	70	

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

SAN MIGUEL, A., Pastizales Naturales Españoles, E.T.S.I.Madrid.

RIGUEIRO,A., Pastoreo controlado en los bosques gallegos, El Campo:29-33

SAN MIGUEL, A, La dehesa Española, E.T.S.I.Madrid.

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, Universidad de Santiago

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, ICONA (MAPA).Madrid

MONTOYA, J. M., Pastoralismo Mediterráneo, ICONA Madrid

SILVA,F.J, Prácticas agroforestales en pinares y eucaliptales atlánticos, Congreso Forestal Español.Lourizán (Pontevedra).Po

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**Recommendations**

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**Subjects that continue the syllabus**

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Biology: Plant Biology/P03G370V01201

Forest Ecology/P03G370V01402

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**Subjects that are recommended to be taken simultaneously**

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Forestry/P03G370V01401

Forest management/P03G370V01605

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**Subjects that it is recommended to have taken before**

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Botany/P03G370V01303

Edaphology/P03G370V01302

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**IDENTIFYING DATA****Wood preservation and drying technology**

Subject	Wood preservation and drying technology			
Code	P03G370V01705			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	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	<a href="http://www.forestaes.uvigo.es">http://www.forestaes.uvigo.es</a>			
General description	(*)Asignatura que trata las dos tecnologías básicas para el uso industrial de la madera			

**Competencies**

Code	Typology
CG11 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.	
CE31 Knowledge for the calculation and design of carpentry facilities. Drying, debarking and crushing of wood.	• know • Know How
CT5 Capacity for information management, analysis and synthesis	
CT6 Organization and planning capacity	• Know How
CT8 Ability to solve problems, critical reasoning and decision making	

**Learning outcomes**

Learning outcomes	Competences
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.	CG11 CE31 CT5
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.	CT6 CT8
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.	
18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions.	

**Contents**

## Topic

Technology of wood conservation Pathologies of wood	Natural wood durability and impregnability Types of wood use Protective products and application systems Protector application systems Treatments of wood different from the use of chemicals Wood treatment - sawmills, joinery and carpentry Technical report on pathology Constructive measures for the protection of wood Reinforcement of wooden structures
Wood drying technology	Physical principles of drying Natural drying Artificial drying Phases of artificial drying Predecaderos Drying tunnels Drying Chambers Drying of wood by special methods Defects caused by drying Programming of drying processes Design of dryers

**Planning**

	Class hours	Hours outside the classroom	Total hours
Lecturing	28	80	108
Problem solving	8	18	26
Studies excursion	4	6	10
Laboratory practical	2	0	2
Introductory activities	1	0	1
Problem and/or exercise solving	2	0	2
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**

	Description
Lecturing	Exposition of objectives and contents and relevance of the same within the set of competences of the subject
Problem solving	Type and oral presentation problem solving seminars
Studies excursion	Explanation "in situ" of industrial processes of drying and conservation of wood
Laboratory practical	Explanation of the handling of dryers
Introductory activities	Presentation of the objectives and development of the subject

**Personalized assistance**

Methodologies	Description
Problem solving	
Laboratory practical	

**Assessment**

	Description	Qualification	Evaluated Competences
Lecturing	(*)Evaluación continua a través de la asistencia a las sesiones impartidas	10	
Problem solving	(*)Evaluación continua a través de la asistencia a las clases prácticas impartidas	10	
Studies excursion	(*)Presentación de una memoria de las visitas realizadas	5	
Problem and/or exercise solving	(*)Evaluación de la prueba de evaluación sobre los contenidos teóricos de la asignatura	55	
Problem and/or exercise solving	(*)Evaluación de las pruebas de realización de ejercicios	20	

**Other comments on the Evaluation**

Exam calendar:

First Call: January 24, 2020, 4:00 p.m.

Second Call: June 26, 2020, 4:00 p.m.

Publication of notes by official methods.

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### **Sources of information**

#### **Basic Bibliography**

#### **Complementary Bibliography**

Oscar González-Prieto, Patoloxía da Madeira Estrutural, Xunta,

F. Arriaga, Intervención en estructuras de madera, AITIM,

Fernando Peraza, Protección Preventiva de la Madera, AITIM,

J.I. Fernández-Golfín Seco, Manual de secado de La Madera, AITIM,

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

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### **Recommendations**

#### **Subjects that continue the syllabus**

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

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#### **Subjects that are recommended to be taken simultaneously**

Primary wood processing industries/P03G370V01706

Industrial organisation and processes in the wood industry/P03G370V01707

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#### **Subjects that it is recommended to have taken before**

Wood technology/P03G370V01606

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**IDENTIFYING DATA****Primary wood processing industries**

Subject	Primary wood processing industries			
Code	P03G370V01706			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish Galician			
Department				
Coordinator	Bartolome Mier, Javier			
Lecturers	Bartolome Mier, Javier González Prieto, Óscar			
E-mail	jbartolome@uvigo.es			
Web	<a href="http://www.forestales.uvigo.es">http://www.forestales.uvigo.es</a>			
General description	*Asignatura In which they study the technologies of manufacture of the basic products of forest origin: wood sawed and boards			

**Competencies**

Code	Typology
CG11 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.	
CG12 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.	
CE29 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.	• know • Know How
CT4 Sustainability and environmental commitment	
CT8 Ability to solve problems, critical reasoning and decision making	

**Learning outcomes**

Learning outcomes	Competences
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.	CG11 CG12 CE29
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.	CT4 CT8
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.	
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.	



<b>Contents</b>	
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	34	87	121
Studies excursion	4	2	6
Laboratory practical	6	0	6
Introductory activities	1	0	1
Problem and/or exercise solving	1	0	1
Practices report	0	2	2
Laboratory practice	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

### **Personalized assistance**

### **Assessment**

	Description	Qualification	Evaluated Competences
Introductory activities	(*).	0	
Lecturing	Continuous evaluation through the assistance to the classes of classroom	7	CE29
Studies excursion	Presentation of a memory of the visits realised	10	CE29
Laboratory practical	(*)Reconocimiento macroscópico de las maderas comerciales en España	20	CE29
Problem and/or exercise solving	Evaluation of the theoretical knowledges through proofs of short answer	60	CE29
Practices report	*Elaboración Of guide of the commercial wooden species in Spain	3	CE29
Laboratory practice		0	

### **Other comments on the Evaluation**

Calendar of examinations:

First Announcement: 22 of jan of 2020, 16.00 Second

Hours Announcement: 22 of juneof 2020 16.00 Hours

The official dates and the possible modifications are exposed in the official board of the Forest EE and in the web  
#[http://forestales.uvigo.es/\\*gl/](http://forestales.uvigo.es/*gl/)

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### **Sources of information**

#### **Basic Bibliography**

#### **Complementary Bibliography**

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### **Recommendations**

#### **Subjects that continue the syllabus**

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

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#### **Subjects that are recommended to be taken simultaneously**

Industrial organisation and processes in the wood industry/P03G370V01707

Wood preservation and drying technology/P03G370V01705

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#### **Subjects that it is recommended to have taken before**

Wood technology/P03G370V01606

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**IDENTIFYING DATA****Industrial organisation and processes in the wood industry**

Subject	Industrial organisation and processes in the wood industry			
Code	P03G370V01707			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish Galician			
Department				
Coordinator	García-Pintos Escuder, Adela			
Lecturers	García-Pintos Escuder, Adela González Prieto, Óscar			
E-mail	adelagpe@uvigo.es			
Web	<a href="http://www.forestales.uvigo.es">http://www.forestales.uvigo.es</a>			
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 da produción.			

**Competencies**

Code	Typology
CG12 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.	
CE30 Ability to know, understand and use the principles of: knowledge of the basic principles of the second transformation processes of wood.	<ul style="list-style-type: none"> <li>• know</li> <li>• Know How</li> <li>• Know be</li> </ul>
CE31 Knowledge for the calculation and design of carpentry facilities. Drying, debarking and crushing of wood.	<ul style="list-style-type: none"> <li>• know</li> <li>• Know How</li> <li>• Know be</li> </ul>
CT5 Capacity for information management, analysis and synthesis	
CT8 Ability to solve problems, critical reasoning and decision making	

**Learning outcomes**

Learning outcomes	Competences
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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. CG12  
CE30  
CE31
- 3R. 2018 Be conscious of the multidisciplinary context of the engineering. CT5
- 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. CT8
- 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.
- 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.
- 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.
- 18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions.

## Contents

### Topic

The sector of second transformation of the wood	The carpentry and furniture industry in: <ul style="list-style-type: none"> <li>· Galicia</li> <li>· Spain</li> <li>· Europe</li> </ul>
Industrial operations on wood and boards Mechanization of wood and boards	Industry 4.0 Adhesives and gluing techniques in the wood industry Application of edges on boards Application of decorative surfaces on boards Sanding practices in carpentry and furniture Finishing technology on wood and boards
Basic principles and production management tools	Basic concepts Tools for supply chain management, purchasing and inventory Mathematical tools and models for the optimization of production
Basic principles and tools for continuous improvement in the organization of industrial production	Lean management basics and production excellence Application of Lean management to the wood industry Other tools: JIT, six-sigma

## Planning

	Class hours	Hours outside the classroom	Total hours
Introductory activities	1	0	1
Lecturing	17	44	61
Problem solving	11	30	41
Mentored work	7	20	27
Studies excursion	8	10	18
Problem and/or exercise solving	2	0	2

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

## Methodologies

	Description
Introductory activities	Introduction to the objectives and development of the subject
Lecturing	Structured exposition of objectives, theoretical contents and exemplifications of the subjects and sub-themes that form the program of the subject

Problem solving	Active participation in the resolution of problems and / or exercises
Mentored work	Resolution of small practical exercises that accompany a theoretical explanation. Seminars of approach and resolution of type problems with oral presentation
Studies excursion	Explanation "in situ" of the organization and industrial processes in the carpentry and furniture industries

### Personalized assistance

Methodologies	Description
Mentored work	The tutoring hours will be indicated at the beginning of the course
Problem solving	The tutoring hours will be indicated at the beginning of the course

### Assessment

	Description	Qualification	Evaluated Competences
Lecturing	(*)Participación activa no debate que se expoña na aula sobre os conceptos teóricos	10	CE30 CE31
Mentored work	(*)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	5	CE30 CE31
Studies excursion	(*)Presentación dunha memoria das visitas realizadas	5	CE30 CE31
Problem and/or exercise solving	(*)Proba escrita sobre os contidos teóricos e prácticos da materia	80	CE30 CE31

### Other comments on the Evaluation

### Sources of information

#### Basic Bibliography

Jay Heizer, Barry Render, Dirección de la producción y de operaciones : decisiones tácticas, 11, Pearson Educación, 2015, Madrid

#### Complementary Bibliography

Carlos Rodrigo Illera, María Pilar Alberca Oliver, Dirección de la producción, Sanz y Torres, 2015, Alcorcón

Lluís Cuatrecasas Arbós, Organización de la producción y dirección de operaciones : sistemas actuales de gestión eficiente y competitiva, Díaz de Santos, 2011, Madrid

Tony Crespo Franco, Pilar Piñeiro García, Producción : planificación, programación e control : exercicios resoltos, Universidade de Vigo, Servizo de Publicacións, 2005, Vigo

Daniel Arias Aranda, Beatriz Minguela Rata (directores), Dirección de la producción y operaciones : decisiones operativas, Pirámide, 2018, Madrid

Javier Santos, Richard A. Wysk, José Manuel Torres, Mejorando la producción con lean thinking, 2, Pirámide, 2015, Madrid

### Recommendations

#### Subjects that are recommended to be taken simultaneously

Primary wood processing industries/P03G370V01706

#### Subjects that it is recommended to have taken before

Wood technology/P03G370V01606

**IDENTIFYING DATA****Product development and innovation in the wood industry**

Subject	Product development and innovation in the wood industry			
Code	P03G370V01708			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	4th	1st
Teaching language				
Department				
Coordinator				
Lecturers				
E-mail				

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

**IDENTIFYING DATA****Innovation and development of products in the forest industry**

Subject	Innovation and development of products in the forest industry			
Code	P03G370V01709			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish Galician			
Department				
Coordinator	García-Pintos Escuder, Adela			
Lecturers	Bartolome Mier, Javier García-Pintos Escuder, Adela			
E-mail	adelagpe@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			

**Competencies**

Code	Typology
CE31 Knowledge for the calculation and design of carpentry facilities. Drying, debarking and crushing of wood.	• know
CT4 Sustainability and environmental commitment	• know • Know How • Know be
CT6 Organization and planning capacity	• Know How • Know be
CT10 Autonomous Learning	• Know How • Know be

**Learning outcomes**

Learning outcomes	Competences
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.	CE31 CT4 CT6 CT10
3R. 2018 Be conscious of the multidisciplinary context of the engineering.	CT10
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.	
7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.	
9R. 2018 Capacity to consult and apply codes of good practices and security 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.	
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.	
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.	

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**Contents**

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## Topic

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(*)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

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(*)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 tableiro 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

## Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	23	70	93
Autonomous practices through ICT	6	10	16
Laboratory practical	4	6	10
Mentored work	11	18	29
Problem and/or exercise solving	2	0	2

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

## Methodologies

	Description
Lecturing	(*)Explicación de conceptos teóricos y exemplificacións
Autonomous practices through ICT	(*)Resolución de casos prácticos de deseño de mobles modulares
Laboratory practical	(*)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
Mentored work	(*)O estudante realizará un proxecto de desenvolvemento dun novo produto tanto no aula como de xeito autónomo baixo as directrices e a supervisión do profesor.

## Personalized assistance

Methodologies	Description
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Lecturing

Autonomous practices through ICT

Mentored work

### Assessment

	Description	Qualification	Evaluated Competences
Lecturing	(*)Asistencia e participación activa nas sesións magistrales	10	
Laboratory practical	(*)Actividades de aplicación dos coñecementos a situacións concretas e de adquisición de habilidades básicas e procedimentais relacionadas coa materia obxecto de estudo.	5	
Mentored work	(*)O estudante realizará un proxecto de desenvolvemento dun novo produto	50	
Problem and/or exercise solving	(*)Proba escrita a final de curso para a avaliación das competencias adquiridas ao longo do curso	35	

### Other comments on the Evaluation

#### Sources of information

##### Basic Bibliography

##### Complementary Bibliography

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

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

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

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

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

#### Recommendations

##### Subjects that continue the syllabus

Environmental Impact/P03G370V01504

##### Subjects that are recommended to be taken simultaneously

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

##### Subjects that it is recommended to have taken before

Basics of business economics/P03G370V01104

Wood technology/P03G370V01606

Wood preservation and drying technology/P03G370V01705

**IDENTIFYING DATA****Management of protected areas and biodiversity**

Subject	Management of protected areas and biodiversity			
Code	P03G370V01801			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	4th	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	Cordero Rivera, Adolfo			
Lecturers	Cordero Rivera, Adolfo			
E-mail	adolfo.cordero@uvigo.es			
Web	<a href="http://ecoevo.uvigo.es">http://ecoevo.uvigo.es</a>			
General description	(*)Introdución aos principios da Bioloxía da Conservación aplicados á Xestión de Espazos protexidos e Conservación da Biodiversidade			

**Competencies**

Code	Typology
CG2	Ability to analyze the ecological structure and function of forest systems and resources, including landscapes.
CG3	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 .
CG7	Ability to solve technical problems derived from the management of natural spaces.
CE36	Ability to solve technical problems derived from the management of natural spaces. Conservation of biodiversity. • Know How
CT2	Ability to communicate orally and written in Spanish or in English • Know How
CT3	Ability to communicate orally and in writing specifically in the Galician language • Know How
CT4	Sustainability and environmental commitment
CT5	Capacity for information management, analysis and synthesis
CT6	Organization and planning capacity
CT8	Ability to solve problems, critical reasoning and decision making

**Learning outcomes**

Learning outcomes	Competences
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2R. 2018 Knowledge and understanding of the disciplines of engineering of the speciality, to the necessary level to acquire the rest of the competitions of the qualifications, including notions of the last advances.	CG2 CG3 CG7
3R. 2018 Be conscious of the multidisciplinary context of the engineering.	CE36
4R. 2018 Capacity to analyze products, processes and complex systems in the field of study; to choose and apply the appropriate analytical, of calculation and experimental methods and correctly interpret the results of these analyses.	CT2 CT3 CT4
6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as to select and apply appropriate methods for the project.	CT5 CT6 CT8
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.	
14R. 2018 Capacity to apply norms of engineering in 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 updated of the scientific and technological news.	

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## Contents

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Topic	
1. The science of conservation.	The origins and brief history of conservationist movements. Principles of conservation biology. Ecology and Environmentalism. Importance of science in conservation.
2. The ecological values and functions of biodiversity.	Genetic, species and ecosystem diversity: the concept of biodiversity. Why we should conserve the species? The intrinsic value of species and their conservation status. The instrumental values and rarity of the species. Ecosystemic values.
3. Biodiversity and stability.	The concept of stability. The diversity-stability debate (a history of this controversy, current studies, compartmentalization, diversity and global change, implications for conservation biology). Retrogression.
4. Ecological principles in the exploitation of natural resources.	The concept of maximum sustainable yield. Principles for the exploitation of resources. Genetic changes in exploited populations. The exploitation of forests. Forest certification (FSC, PEFC).
5. Extinction	The number of species that inhabit the planet. The causes of the rarity of the species. IUCN classification. Estimation of extinction rates. Processes and causes of extinction. Degradation and destruction of habitats. Metapopulation dynamica. Population Viability Analysis (PVA).
6. Management of species and populations.	Management units. In situ and ex situ conservation. Limiting resources. Control of threats. Translocations and artificial breeding. Role of zoos, botanical gardens and museums. Importance of ethology in conservation. Case study: the example of the black-footed ferret.
7. Management and restoration of ecosystems	Principles of ecosystem management. Modified ecosystems (forest exploitation, agricultural ecosystems, aquatic ecosystems). Restoration of ecosystems.
8. Social factors in conservation.	Description of etic values. Valuation of priorities. Cultural changes. Environmental education.
9. The economics of conservation.	Economic evaluation of biodiversity (types of sustainability, decision models in ecological economics, the value of biodiversity). Costs of conservation (method of cost of travel, the method of revealed preferences, an economic and ecological perspective of market). The tragedy of the commons.

10. Political action and conservation.	International organizations (IUCN MAB program). Government agencies: The Spanish strategy for sustainable development. Spanish strategy for the conservation of biodiversity. Non-governmental organizations (NGOs). Companies and individuals. Scientific research, policy and conservation. Ecologism as a political ideology.
11. Reserves and protected parks.	Objectives of the creation of reserves (the problem of fragmentation). Representation of biodiversity. The main features of reserve design: size, dynamism, spatial context, connectivity, buffer zones. Protected natural areas of Galicia.
12. Conservation legislation	International Biodiversity Agreements (Bern, Ramsar, Washington (CITES), Bonn, Biodiversity (Rio de Janeiro). European legislation (Birds Directive, Habitats Directive) State legislation (Law 42/2007 on Natural Heritage, Decree 139 / 2011 Catalog endangered species, Decree 1628/2011 Catalog of alien invasive species) Legislation of Galicia: Galician law of conservation of nature.
13. Management plans for endangered species.	Guidelines, objectives and feasibility. Examples: the management plan for the European turtle ( <i>Emys orbicularis</i> ) in Galicia; management plan of the odonate populations of European interest; Reproductive biology and management of <i>Corema album</i> in the Cíes Islands.
Practical 1. Design of Reserves: Testing the species-area relationship.	(*)
Practical 2. Taxonomic principles and characteristics of communities. Its use in the decision-making process on conservation.	(*)
Practical 3. Contingent assessment	Discussion about the social attitudes on conservation issues and valuation of emblematic species
Practical 4. Analysis of the viability of populations: using the vortex program.	(*)
Practical 5. Field lesson. Visit to the Center of Zoogenetic Resources of Galicia.	Study of the systems of conservation of germoplasm of autochthonous cattle breeds.
Practical 6. Field lesson. Visit to the Natural Park of Fragas do Eume.	Contact with the managers of the protected area, to discuss its specific characteristics and problems.
Practical 7. Field lesson. Visit to the National Park of the Atlantic Islands of Galicia.	Given the peculiarities of the Park, with its insularity, the visit will be to the reception center of visitors in Vigo, if the climatic conditions do not allow visiting the islands.

### Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	30	52.5	82.5
Studies excursion	11	16.5	27.5
Mentored work	5	10	15
Computer practices	4	4	8
Problem and/or exercise solving	2	0	2
Essay	5	10	15

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

### Methodologies

	Description
Lecturing	Lectures in the classroom
Studies excursion	Field lessons
Mentored work	Personal work under supervision
Computer practices	Practical lessons in the computers room

### Personalized assistance

Tests	Description
Essay	A sand county almanac, Aldo Leopold. Monographic work on the book

### Assessment

	Description	Qualification	Evaluated Competences
Lecturing	They will be evaluated through short answer exams.	65	CG2 CG7

Studies excursion	They will be evaluated in the examination of the subject through specific questions.	5	CG7
Mentored work	It will be evaluated in the exam of the subject through specific questions or through written reports.	10	CG7 CE36
Computer practices	They will be evaluated in the exam of the subject through specific questions or through written reports.	10	CG7 CT5
Problem and/or exercise solving	They are part of the written exam of the course.	0	
Essay	Delivery of a monographic work on the book "A sand county almanac", by Aldo Leopold. The essay must be submitted one month before the exam date. It must consist of a summary of the book and a section of personal analysis of it.	10	

### Other comments on the Evaluation

The competences of the subject will be evaluated in the written exam.

The attendance to the practicals is compulsory.

The unjustified absence of more than one practical implies a negative evaluation. The monographic work on the book by Aldo Leopold is an essential condition for the evaluation, and must be submitted at the most one month before the exam.

Dates of exams:

1st period: 21 May 2020, 12 h

2nd period: 9 July 2020, 16 h

The official dates and any subsequent modification are available on the web <http://forestaes.uvigo.es/gl/>

### Sources of information

#### Basic Bibliography

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

#### Complementary Bibliography

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

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

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

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

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

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, Malden

### Recommendations

#### Subjects that it is recommended to have taken before

Forest Ecology/P03G370V01402

**IDENTIFYING DATA****Forest Fires**

Subject	Forest Fires			
Code	P03G370V01802			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	4th	2nd
Teaching language	Spanish Galician			
Department				
Coordinator				
Lecturers				
E-mail				
Web				
General description	Technicians of prevention *and extinction of forest *fires			

**Competencies**

Code	Typology
CG1	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.
CG3	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 .
CG13	Ability to design, direct, elaborate, implement and interpret projects and plans, as well as to write technical reports, recognition reports, assessments, appraisals and appraisals.
CE9	Ability to know, understand and use the principles of: forestry hydraulics; hydrology and hydrological-forest restoration.
CE27	Ability to know, understand and use the principles of: prevention and fight against forest fires.
	• know • Know How
CT4	Sustainability and environmental commitment
CT7	Skill in the use of IT tools and ICTs.
	• Know How
CT8	Ability to solve problems, critical reasoning and decision making

**Learning outcomes**

Learning outcomes	Competences
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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.	CG1 CG3 CG13
3R. 2018 Be conscious of the multidisciplinary context of the engineering.	CE9
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.	CE27 CT4 CT7 CT8
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
Computer practices	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
Computer practices	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	
Computer practices	
Studies excursion	
Autonomous problem solving	

### Tests

	Description
Problem and/or exercise solving	
Problem and/or exercise solving	

### Assessment

	Description	Qualification	Evaluated Competences
Autonomous problem solving	*Approach of problems that he student has to resolve of personalised form *out of class to *the wide of him course	30	CE27 CT7
Problem and/or exercise solving	*Approach of questions of *brief answer that he student has to resolve in class in him act of evaluation	21	CE27
Problem and/or exercise solving	*Approach of problems that he student has to resolve in class in him act of evaluation	49	CE27

### Other comments on the Evaluation

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

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**Sources of information**

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**Basic Bibliography**

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

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

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

**Complementary Bibliography**

---

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

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

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**Recommendations**

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**Subjects that it is recommended to have taken before**

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Physics: Physics I/P03G370V01102

Physics: Physics II/P03G370V01202

Edaphology/P03G370V01302

Forestry/P03G370V01401

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**IDENTIFYING DATA****Cellulose, pulp and paper**

Subject Cellulose, pulp  
and paper

Code P03G370V01803

Study programme (\*)Grao en  
Enxeñaría Forestal

Descriptors	ECTS Credits	Type	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	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	4th	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	Bartolome Mier, Javier			
Lecturers	Bartolome Mier, Javier			
E-mail	jbartolome@uvigo.es			
Web	<a href="http://www.forestaes.uvigo.es">http://www.forestaes.uvigo.es</a>			
General description	Introduction to the systems of guarantee of the quality and of management of labour risks. Methods of continuous improvement			

**Competencies**

Code		Typology
CE39	Ability to know, understand and use the principles of quality control in the forest industry.	• know • Know How
CE40	Ability to know, understand and use the principles of industrial safety and hygiene.	• know • Know How
CT5	Capacity for information management, analysis and synthesis	
CT8	Ability to solve problems, critical reasoning and decision making	

**Learning outcomes**

Learning outcomes	Competences
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.	CE39 CE40 CT5 CT8
3R. 2018 Be conscious of the multidisciplinary context of the engineering.	CT8
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.	
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.	
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.	

**Contents**

Topic	
1.- Forest industry and quality	1.1. General concepts

2.- General concepts of the quality	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 psicocycology

### Planning

	Class hours	Hours outside the classroom	Total hours
Case studies	6	10	16
Studies excursion	4	2	6
Lecturing	34	72	106
Problem and/or exercise solving	2	20	22

\*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 theoretic concepts and exemplifications

### Personalized assistance

Methodologies	Description
Lecturing	
Case studies	

### Assessment

	Description	Qualification	Evaluated Competences
Lecturing	*Participación Active in the debates that pose	10	CE39 CE40

Case studies	*Participacion Active in the *resolucion of the supposed *practicos that pose	10	CE39 CE40
Studies excursion	Presentation of the memory of the visits realised	10	CE39 CE40
Problem and/or exercise solving	*Valoracion Of the knowledge of the matter in *funcion to the questions realised	70	CE39 CE40

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### Other comments on the Evaluation

Calendar of examinations:

First Announcement: 20 May 2020, 16.00 Hours

Second Announcement: 10 July 2020 16.00 Hours

The official dates and the possible modifications are exposed in the official board of the \*EE Forest and in the web

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### Sources of information

**Basic Bibliography**

**Complementary Bibliography**

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### Recommendations

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### Other comments

\*N|To

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**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	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	4th	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	Lorenzo Fouz, David			
Lecturers	Lorenzo Fouz, David Ortiz Torres, Luis			
E-mail	davidlorenzofouz@gmail.com			
Web				
General description				

**Competencies**

Code		Typology
CG1	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.	
CG11	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.	
CE37	Knowledge of the basic principles of the chemical transformation of wood and its industrial processes, in particular cellulose and paper.	
CT2	Ability to communicate orally and written in Spanish or in English	
CT5	Capacity for information management, analysis and synthesis	
CT10	Autonomous Learning	

**Learning outcomes**

Learning outcomes	Competences
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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.	CG1 CG11 CE37
3R. 2018 Be conscious of the multidisciplinary context of the engineering.	CT2
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.	CT5 CT10
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.	
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.	

## Contents

### Topic

1º Part: chemical Industry of the wood: Industry of the paste and of the paper	<ol style="list-style-type: none"> <li>1. Paste, paper and cardboard. Requests and sources of fibres *papeleras. Chemical composition of the wood. Behaviour of the fibres *celulósicas.</li> <li>2. Characteristics of the wood. Effect of the morphology of the fibres on the properties of the paper. Identification of wooden species.</li> <li>3. The resources of the wood. Measure of the wood for paste. Preparation of the wood for the manufacture of cellulose. Control of quality of the *astillas.</li> <li>4. Processes of obtaining of pastes. Mechanical pastes, chemical, *semiquímicas and pastes to dissolve. Comparison of pastes and applications of the same.</li> <li>5. The process to the sulphate. Definition of terms and description of the process *kraft. System of recovery of the chemical products. Chemistry of the process *kraft and variables that affect to the cooking to the sulphate.</li> <li>6. Teams of cooking. Discontinuous and continuous digesters. *Designificación Widespread.</li> <li>7. Treatment of the pastes: *Desfibrado, elimination of knots, wash, classification of pastes, thickened, pumping, stored, mixed, dried, cut and *apilado.</li> <li>8. Recovery of the bleaches of cooking. Evaporation. Boiler of recovery. *Caustificación. Calcination. Recovery of by-products.</li> <li>9. Bleaching of pastes. Sequences *ECF and *TCF. Stages of bleaching. Closing of circuits.</li> <li>10. Economy and strategy of operation of a factory of pastes. Control of costs.</li> <li>11. Preparation of the paste for the manufacture of the paper: Disintegration, *refinado, measure and mix of the composition.</li> <li>12. Utilisation of secondary fibres. Disintegration of the *papelote and *destintado.</li> <li>13. Additives no fibrous in the manufacture of the paper.</li> <li>14. Manufacture of the paper □ splits humid and dry part.</li> <li>15. Reduction of the aqueous and atmospheric pollution in the industry *celulósica and *papelera</li> </ol>
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**Planning**

	Class hours	Hours outside the classroom	Total hours
Lecturing	26	54	80
Laboratory practical	23	20	43
Studies excursion	4	10	14
Case studies	1	5	6
Problem solving	1	5	6

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

**Methodologies**

	Description
Lecturing	*impartira Teaching *magistral with exercises type
Laboratory practical	They made you practise and it presented memory of the same
Studies excursion	They made visit to company
Case studies	*hara Study of cases
Problem solving	*resolveran Problems out of the classroom

**Personalized assistance**

Methodologies	Description
Lecturing	
Laboratory practical	
Studies excursion	
Case studies	

**Assessment**

	Description	Qualification	Evaluated Competences
Lecturing		70	CG1 CG11 CE37
Laboratory practical		10	CG11 CE37
Studies excursion		10	CG11 CT2 CT5 CT10
Problem solving		10	CT2 CT5

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

**IDENTIFYING DATA****Internships: Internships**

Subject	Internships: Internships			
Code	P03G370V01981			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	4th	2nd
Teaching language	Spanish Galician			
Department				
Coordinator				
Lecturers				
E-mail				
Web	<a href="http://http://transferencia.uvigo.es/transferencia_gl/practicas/">http://http://transferencia.uvigo.es/transferencia_gl/practicas/</a>			
General description	<a href="http://transferencia.uvigo.es/opencms/export/sites/transferencia/transferencia_gl/documentos/instrucion_curriculares.pdf">http://transferencia.uvigo.es/opencms/export/sites/transferencia/transferencia_gl/documentos/instrucion_curriculares.pdf</a>			

**Competencies**

Code	Typology
CE41	Ability to carry out the professional tasks of the degree in the field of individual and team work, applying, according to the practice in question, some of the techniques and skills that, by way of example and without being exclusive, they are cited in the verification memory.

**Learning outcomes**

Learning outcomes	Competences
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.	CE41
7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.	
9R. 2018 Capacity to consult and apply codes of good practices and security 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.	

**Contents**

Topic	
The contents of the practical will be posed in each particular case by the School of Forest Engineering and the organisation and will attend to the acquisition by part of the student practitioner of some general and specific competitions related in this description of matter.	They developed any practical activity related with the degree
Professional activity of the student by the respective organisation that offer the practice.	They will be able to in practice the competitions purchased in the degree

<b>Planning</b>			
	Class hours	Hours outside the classroom	Total hours
External practices	0	150	150

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

<b>Methodologies</b>	
	Description
External practices	The contents of the practical will be posed in each particular case by the School of Forest Engineering and the organisation and will attend to the acquisition by part of the student practitioner of some general and specific competitions related in this description of matter.

<b>Personalized assistance</b>	
Methodologies	Description
External practices	The student will have a tutor in the centre and one in the company

<b>Assessment</b>			
	Description	Qualification	Evaluated Competences
External practices		100	CE41

**Other comments on the Evaluation**

The positive evaluation of the realisation of the practice will take place on the base of a favourable report issued by the organisation of received of the student practitioner. Anyway the student will have to present to the Direction of the School of Forest Engineering a memory summary of the practice realised

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

**Recommendations**

**Other comments**

The fixed competition worked is the \*CE41, apart from this the tutor marked the others competitions worked that will depend on the practices realised and will be able to be in the group of the general, transversal and specify.

GENERAL COMPETITIONS: \*CG1-\*CG14

TRANSVERSAL COMPETITIONS: \*CT1-\*CT10

SPECIFIC COMPETITIONS: \*CE1-\*CE40

**IDENTIFYING DATA****Final Year Dissertation**

Subject	Final Year Dissertation		
Code	P03G370V01991		
Study programme	(*)Grao en Enxeñaría Forestal		
Descriptors	ECTS Credits	Type	Year
	12	Mandatory	4th
Teaching language	Spanish		
	Galician		
Department			
Coordinator			
Lecturers			
E-mail			
Web	<a href="http://www.forestales.uvigo.es/sites/default/files/Reg%20TFG%20Enx%20Forestal%20APROBADO%20comisi%C3%B3n%20Permanente%207_3_13.pdf">http://www.forestales.uvigo.es/sites/default/files/Reg%20TFG%20Enx%20Forestal%20APROBADO%20comisi%C3%B3n%20Permanente%207_3_13.pdf</a>		

**General description** The \*TFG is a personal work that each student will realise of autonomous way under \*tutorización educational, and has to allow him show of form integrated the acquisition of the formative contents and the competitions associated to the title.

In particular, it will have to contribute to the development of the following:

t) Capacity to develop the methodology of a project and formulate a plan of work related with an or varied of the fields of present knowledge in the \*Grao;

\*b) Capacity to execute the work projected;

\*c) Capacity to present and defend publicly the \*TFG.

In no case it can be a work presented previously by the/the student in some matter of any one another degree, although it can integrate or develop previous partial works facts in the activity of other matters of the degree.

The fact that the \*TFG was a personal and individual work does not exclude that, to develop a proposal of \*envergadura sufficient, can participate varied/the students, each the one who with a precise plot of the global task; this fact will be authorised by the previous Academic Commission favourable report of the Coordinator of the Module of the \*TFG . In this case the \*alumnado involved in an even work will share the person tutor and will have the same court of evaluation, whereas the presentation and defence and the evaluation will be individual for each one of the parts.

The \*TFG will be able to elaborate in institutions or external companies to the University of Vigo, in which they establish in the institutional agreements signed. In whose case will exist the figure of a person \*cotutora pertaining to the institution or company. The person academic tutor will share with the person \*cotitora the tasks of direction and orientation of the/the student, and will be, in any case, responsibility of the academic tutor facilitate the administrative management of the realisation and defence.

The student has right to the recognition of the \*autoria of the \*TFG elaborated and to the protection of his copyright. The titularity of the derivative rights will share with the \*titores, with the \*cotitores, the own University of Vigo and with the public entities or deprived to which belong, in the planned conditions in the valid legislation.

**Competencies**

Code	Typology
CB1	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
CB2	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
CB3	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
CB4	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
CB5	That students have the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous.

**Learning outcomes**

Learning outcomes	Competences
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.	CB1 CB2 CB3
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.	CB4 CB5
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	300	300

\*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

## Personalized assistance

## Assessment

Description

Qualification

Evaluated Competences

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**Other comments on the Evaluation**

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**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

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**Recommendations**

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