



## (\*)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. Juan Picos Martín

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

Secretary: D. José Manuel Casas Mirás

#### Governing bodies:

- Faculty Assembly

- Commissions:

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

#### Departments in the Centre:

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

## Servizo e Infraestructuras do Centro

1. Administración: o horario de atención ao público de secretaría é de 9:00 a 14:00 horas.
2. Bibliotecas: [http://www.uvigo.es/uvigo\\_gl/Administracion/Biblioteca/directorio/campus\\_pontevedra.html](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	342,11m <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. Enxeñería Eléctrica	110,73 m <sup>2</sup>	21	NO	NO
2º	Lab. Enxeñería 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

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### 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/estudiostitulaciones](http://www.uvigo.es/uvigo_gl/estudiostitulaciones)

[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/reglamento\\_estudiantes.html](http://secxeral.uvigo.es/secxeral_gl/normativa/normativauniversidad/estudaintes/reglamento_estudiantes.html)

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

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

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### 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/>

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## (\* )Grao en Enxeñaría Forestal

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### Subjects

#### Year 3rd

Code	Name	Quadmester	Total Cr.
P03G370V01501	Forest constructions	1st	6
P03G370V01502	Forestry machinery	1st	6
P03G370V01503	Projects	1st	6
P03G370V01504	Environmental Impact	1st	6

P03G370V01505	Forest certification and legislation	1st	6
P03G370V01601	Use of forests	2nd	6
P03G370V01602	Dasometry	2nd	6
P03G370V01603	Repopulation	2nd	6
P03G370V01604	Forestry hydrology	2nd	6
P03G370V01605	Forest management	2nd	6
P03G370V01606	Wood technology	2nd	6
P03G370V01607	Xylo energy	2nd	6
P03G370V01608	Environmental management	2nd	6
P03G370V01609	Environmental Engineering	2nd	6

**IDENTIFYING DATA****Forest constructions**

Subject	Forest constructions			
Code	P03G370V01501			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Mandatory	3rd	1st
Teaching language	Spanish Galician			
Department				
Coordinator	Riveiro Rodríguez, Belén			
Lecturers	Pece Montenegro, Santiago Riveiro Rodríguez, Belén			
E-mail	belenriveiro@uvigo.es			
Web	<a href="http://http://faitic.uvigo.es/index.php/es/">http://http://faitic.uvigo.es/index.php/es/</a>			
General description	(*)Principios, Coñecementos e Normas nos que se fundamentan as Construcións Forestais e o deseño de Vías Forestais			

**Competencies**

Code	
CG7	Ability to solve technical problems derived from the management of natural spaces.
CG9	Knowledge of hydraulics, construction, electrification, forest roads, machinery and mechanization necessary both for the management of forest systems and for their conservation.
CE18	Ability to know, understand and use the principles of: forest constructions and forest roads.
CT1	Ability to understand the meaning and application of the gender perspective in the different fields of knowledge and in professional practice with the aim of achieving a more just and egalitarian society
CT2	Ability to communicate orally and written in Spanish or in English
CT4	Sustainability and environmental commitment
CT5	Capacity for information management, analysis and synthesis
CT6	Organization and planning capacity
CT7	Skill in the use of IT tools and ICTs.
CT8	Ability to solve problems, critical reasoning and decision making
CT9	Teamwork skills, skills in interpersonal relationships and leadership.
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.	CG7	CE18	CT1
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.	CG9		CT2 CT4 CT5 CT6 CT7
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.			CT8 CT9 CT10
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.			
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.			
18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions.			
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.			

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## Contents

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### Topic

1.- Previous concepts of mechanics and principles of materials resistance.	1.- Moment of a force, Balance of a body, Diagram of the Free Body, Reactions, Unions and supports. 2.- Centers of gravity, centroid, first-order static moment, moment of inertia, spinning radius. 3.- Forces distributed 4.- Curtains 5.- General principles and definitions of the Resistance of Materials.
2.- The elastic solid	1.- Tension state of a point, intrinsic components of tension, stress matrix, stresses, strain matrix. 2.- Diagrams of solicitations. 3.- Introduction to Hyperstaticity, degree of hyperstability, Compatibility Equations of Deformations.
3.- Axial Efforts. Traction-Compression	1.- Traction test of ductile materials. 2.- The elastic regime. Young's Modulus, Poisson's Coefficient. 3.- Uniaxial tensile strain. 4.- Hyperstaticity in bars subjected to axial stress.
4.- Introduction to the Cut	1.- Cutting voltage, angular distortion, Rigidity module. 2.- Joints: screws and rivets. 3.- Types of failure in joints by shear stress.
5.- Introduction to Twisting	1.- Elementary theory of torsion in prisms of circular section. 2.- Tension and strain analysis, turning angle.
6.- Introduction to Flexion	1. Beams: definition and classes. Applied forces 2.- Cutting force and bending moment 3.- Relations between shear, bending and load 4.- Cutting and bending diagrams 5.- Types of flexion. Hypothesis and limitations 6.- Normal stresses. Law of Navier 7.- Concept of resistant module 8.- Bending deformations: Differential Equation of the Elastic, Theorems of Mohr. 9.- Hyperelastic Flexing

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7- Introduction to Buckling	1.- Buckling instability. 2. Euler's critical load. 3.- Limit of application of the formula of Euler, mechanical slenderness, efficient sections.
8.- Introduction to the analysis of structures	1.- Reticulated structures. 2.- Porticos, semipórticos and pictures. 3.- Initiation to the matrix calculation. 4.- Limit States. 5.- Degrees of Freedom.
9.- Constructive elements: metallic, cement, concrete, wood.	1.- Foundations. Land. 2.- Cement and Concrete. 3.- Industrial Warehouses.
10.- Obligatory standards in construction.	1.- Standards obliged to comply. Building Technical Code. 2.- Eurocode.
11.- Forest roads	1.- Land analysis and soil improvement. 2.- Planning of Roads
12.- Construction Projects	1.- Calculation Systems and Budget. 2.- Systems of contracting and control of works. Pert, Gant. 3.- Quality control of buildings. 4.- Prevention Plan. 5.- Principles of Maintenance.

### Planning

	Class hours	Hours outside the classroom	Total hours
Introductory activities	1	1	2
Lecturing	21	42	63
Problem solving	11	22	33
Practices through ICT	9	27	36
Essay	1	8	9
Objective questions exam	1	2	3
Essay questions exam	2	2	4

\*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	Efforts to make contact and gather information about the students, and to present the subject.
Lecturing	Presentation by the teacher of the contents on the subject under study, theoretical and / or guidelines for a job, exercise or project to be developed by the student.
Problem solving	Activity which formulated problem and / or exercises related to the course. The student should develop appropriate solutions or right through the exercise routines, application of formulas or algorithms, application processing procedures available information and interpretation of the results. It is often used to complement the lecture.
Practices through ICT	Activities application of knowledge to specific situations, and the acquisition of basic skills and procedural matters related to the object of study, which are held in computer rooms.

### Personalized assistance

#### Methodologies Description

Problem solving	The students will come to the teachers to clarify the concepts necessary to perform the problems and / or exercises performed in the classroom, as well as to clarify / discuss any doubts that may appear after the end of the sessions.
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#### Tests Description

Essay	Students will be able to use face-to-face tutoring, or teledocence tools for correct tutoring by teachers in terms of carrying out work / projects.
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### Assessment

	Description	Qualification	Evaluated Competences
Essay	Along the course students will develop small projects where they will tackle exercises and cases of study that complement the practical sessions. They will serve to verify the acquisition of the competitions CE-18, CG7, CT5, CT6, CT7, CT8, CT9 and CT10.	15	
Objective questions exam	Several tests will take place along the course to verify that the student is acquiring the competences CE-18 and CG9.	10	

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

The evaluation tests corresponding to "Essays", as well as "Objective questions exam" are framed within the continuous evaluation tests of the subject, whose weight on the total of the subject is 25%. All students must complete a "Final Exam", with a weight on the overall evaluation of 75%. It will be necessary to reach a minimum grade of 4.5 points out of 10 in the exam, so that the continuous assessment grade is added. The student must obtain a final grade equal to or greater than 5 points out of 10 in order to pass the subject.

Those students who officially renounce continuous assessment, will be evaluated in a single final written exam, assuming in this case 100% of the score.

The final evaluation will be held on the official dates approved by the Forest Engineering School. There will be two evaluation opportunities: 1st opportunity, on 01.13.2020 at 16:00h; 2nd opportunity, on 06/24/2020, at 16:00h. Also, students who enroll in the call for "Final de Carrera", will have the final evaluation on 23/09/2019, at 9:00 am.

The official dates and potential changes are published in the main board of the School and at the website <http://forestaes.uvigo.es/gl/>

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### **Sources of information**

#### **Basic Bibliography**

#### **Complementary Bibliography**

M. Vázquez, **RESISTENCIA DE MATERIALES**, 4,

P. Jiménez Montoya, **HORMIGÓN ARMADO**, 1,

Rafael Dal-Ré Tenreiro, □ **CAMINOS RURALES. PROYECTO Y CONSTRUCCIÓN**, 1,

MINISTERIO DE FOMENTO, **CODIGO TECNICO DE EDIFICACION**, 1,

Ferdinand P. Beer, **MECÁNICA DE MATERIALES**, 1,

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### **Recommendations**

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

Hydraulics/P03G370V01404

Use of forests/P03G370V01601

Environmental Impact/P03G370V01504

Forest Fires/P03G370V01802

Primary wood processing industries/P03G370V01706

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

Forest certification and legislation/P03G370V01505

Forestry machinery/P03G370V01502

Projects/P03G370V01503

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

Graphic expression: Graphic expression and cartography/P03G370V01101

Physics: Physics II/P03G370V01202

Mathematics: Overview of mathematics/P03G370V01203

Mathematics: Mathematics and IT/P03G370V01103

Chemistry: Chemistry/P03G370V01204

Topography, remote sensing and geographic information systems/P03G370V01403

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### **Contingency plan**

#### **Description**

=== EXCEPTIONAL PLANNING ===

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

=== ADAPTATION OF THE METHODOLOGIES ===

\* Teaching methodologies maintained

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- \* Teaching methodologies modified
- \* Non-attendance mechanisms for student attention (tutoring)
- \* Modifications (if applicable) of the contents
- \* Additional bibliography to facilitate self-learning
- \* Other modifications

=== ADAPTATION OF THE TESTS ===

- \* Tests already carried out

Test XX: [Previous Weight 00%] [Proposed Weight 00%]

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- \* Pending tests that are maintained

Test XX: [Previous Weight 00%] [Proposed Weight 00%]

...

- \* Tests that are modified

[Previous test] => [New test]

- \* New tests

- \* Additional Information
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**IDENTIFYING DATA****Forestry machinery**

Subject	Forestry machinery			
Code	P03G370V01502			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Mandatory	3rd	1st
Teaching language	Spanish			
Department				
Coordinator	Diz Montero, Rubén			
Lecturers	Diz Montero, Rubén			
E-mail	rubendiz@uvigo.es			
Web				
General description	In this **asignatura pretends that he student *purchase *the *essential *knowledges that reads allow to comprise he *operation of wools machines *employed in wools forest *industries, that *know *the types of machines and *installations *more important *and *his *components. *His *knowledge results basic for him *analysis of him *operation, *design *and *construction of wools machines *and of *the teams associated the same *wools, *and in *general wools *industrial *applications in that they are used.			

**Competencies**

Code	
CG9	Knowledge of hydraulics, construction, electrification, forest roads, machinery and mechanization necessary both for the management of forest systems and for their conservation.
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.
CE20	Ability to know, understand and use the principles of forestry machinery and mechanization.
CT2	Ability to communicate orally and written in Spanish or in English
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. CG9 CE20 CT2
- 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.
- 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. Thermal machines. Generalities	Classification, theoretical appearances and principles of operation. Types of engines employed in forest machines.
2. Study of Thermal Engines	Engines of lit caused. Engines of lit by compression.
3. Study of compressors	Types of compressors. Installations of compression of air and pneumatic circuit.
4. Machinery used in forestry explotatrons.	Types of machines. Hydraulic circuits. Bombs and hydraulic engines
5. Machinery used in forestry industries	Installations and circuits

## Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	29	86	115
Presentation	2	10	12
Laboratory practical	14	6	20
Objective questions exam	1	0	1
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	Exhibition by part of the professor of the contents of the matter object of study. Resolution of problems and/or exercises related with the *asignatura
Presentation	Realisation of works in groups on thematic specific and presentation of the same in the classroom
Laboratory practical	Work with real machines in the laboratory to complement the contents of the matter, completed with some practice with specific software. Preparation of memories of practices.

## Personalized assistance

Methodologies	Description
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Lecturing

Laboratory practical

Presentation

### Assessment

	Description	Qualification	Evaluated Competences	
Lecturing	Participation in the class. Proposal of **questions of theory justified on the content given.	0	CE20	
Presentation	Realisation of works on the content of the **asignatura. Exhibition in the classroom.	20	CE20	CT5
Laboratory practical	Realisation of practices of laboratory and delivery of memories on the same.	20	CE20	CT5
Objective questions exam	Resolution of questionnaire of theory type test.	25	CE20	CT5
Problem and/or exercise solving	Resolution of problems and/or exercises related with the *temario of the **asignatura.	35	CE20	CT5

### Other comments on the Evaluation

### Sources of information

#### Basic Bibliography

#### Complementary Bibliography

Moran J and Shapiro H, **Fundamentos de Termodinámica Técnica**, 2004,

Çengel Y. y Boles M., **Termodinámica**, 7ª edición (2011),

Payri F. y Desantes J.M., **Motores de combustión interna alternativos**, 2011,

Agüera Soriano J., **Termodinámica Lógica y Motores Térmicos**, 1993,

Creus Solé A., **Neumática e Hidráulica**, 2010,

IDAE, **Biomasa : maquinaria agrícola y forestal**, 2007,

### Recommendations

#### Subjects that continue the syllabus

Primary wood processing industries/P03G370V01706

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

Physics: Physics I/P03G370V01102

Physics: Physics II/P03G370V01202

Mathematics: Mathematics and IT/P03G370V01103

Hydraulics/P03G370V01404

### Contingency plan

#### Description

=== EXCEPTIONAL PLANNING ===

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

=== ADAPTATION OF THE METHODOLOGIES ===

\* Teaching methodologies maintained

\* Teaching methodologies modified

\* Non-attendance mechanisms for student attention (tutoring)

\* Modifications (if applicable) of the contents

\* Additional bibliography to facilitate self-learning

\* Other modifications

=== ADAPTATION OF THE TESTS ===

\* Tests already carried out

Test XX: [Previous Weight 00%] [Proposed Weight 00%]

...

\* Pending tests that are maintained

Test XX: [Previous Weight 00%] [Proposed Weight 00%]

...

\* Tests that are modified

[Previous test] => [New test]

\* New tests

\* Additional Information

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<b>IDENTIFYING DATA</b>				
<b>Projects</b>				
Subject	Projects			
Code	P03G370V01503			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Mandatory	3rd	1st
Teaching language	Spanish			
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://fatic.uvigo.es/index.php/es/">http://http://fatic.uvigo.es/index.php/es/</a>			
General description	(*)Esta materia é de carácter eminentemente aplicado e co obxectivo de que os alumnos adquiren os coñecementos básicos mediante a aprendizaxe dos conceptos, terminoloxía, teoría, e metodoloxía necesarios para ser capaz de entender, formular e resolver un proxecto.			

<b>Competencies</b>	
Code	
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.
CG14	Ability to understand, interpret and adopt scientific advances in the forest field, to develop and transfer technology and to work in a multilingual and multidisciplinary environment
CE22	Ability to know, understand and use the principles of: methodology, organization and project management.
CE42	Ability to do an original work to be presented and defended before a university court, consisting of a project in the field of specific technologies of Forest Engineering, of a professional nature in which the competences acquired in the teachings and subjects of the career.
CT2	Ability to communicate orally and written in Spanish or in English
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

<b>Learning outcomes</b>		<b>Competences</b>		
Learning outcomes				
3R. 2018 Be conscious of the multidisciplinary context of the engineering.		CG13	CE22	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		CG14	CE42	CT4
*relevante and interpret correctly the results of these analyses.				CT5
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.				CT6
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.				CT8
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.				
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	
Theme I. The project as a concept	- Definition and philosophy of the project - The project cycle
Theme II. The project as a method. Project engineering	- Project methodology. Reliability study - Preliminary project or preliminary project -Project detailed -Project planning - Socio-economic evaluation of projects -Evaluation of projects -Analysis of risk in the evaluation of projects.
Theme III. The project as document	- Content of project documents -Memory -Blueprints -Technical specifications -Budget -Health and Safety issues
Theme IV. The professional activity and the project	- The contracting of technical assistance for the drafting of projects. -The contest of projects and execution of works -The activity of project engineer -The rates of fees.
Theme V. Forestry projects	- Forest projects - Projects in Forest Industry -Silvicultural and Forest Management Projects -Forest infrastructures - Hunting projects -Fishing projects. -Projects for recreation and public use -Projects for the management of protected areas.

## Planning

	Class hours	Hours outside the classroom	Total hours
Presentation	75	0	75
Project based learning	38	0	38
Discussion Forum	12	0	12
Debate	13	0	13
Objective questions exam	2	0	2
Essay	0	10	10

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

## Methodologies

	Description
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.
Project based learning	Performing activities that allow the cooperation of various subjects and students face, working together, to open problems. Allow coaching, among others, the cooperative learning skills, leadership, organizational, communication and strengthening relationships.
Discussion Forum	Activity within a virtual environment in which they discussed various topics related to the academic and / or professional.
Debate	Open discussion between a group of students. You can focus on a topic of subject content, the analysis of a case, the outcome of a project, exercise or problem previously developed a keynote address ...

## Personalized assistance

Methodologies	Description
Presentation	It will explain the matter and the method of evaluation
Project based learning	It will make during the subject a preliminary draft
Discussion Forum	They will boost the discussions and debates in class
Debate	They will boost the discussions and debates in class

## Assessment

Description	Qualification	Evaluated Competences
Presentation	0	
Project based learning	40	CT2 CT6 CT8
Objective questions exam	40	
Essay	20	CT6 CT8

### Other comments on the Evaluation

Official dates and any modification will be accesible in the official notice board and in the web page <http://forestales.uvigo.es/gl/>

### Sources of information

#### Basic Bibliography

#### Complementary Bibliography

BERGILLOS MADRID, J.M, **Metodología de diseño de proyectos**, 1989.,  
 DE COS CASTILLO, M, **Teoría general del proyecto. Dirección de proyectos**, 1995,  
 GÓMEZ SENENT, E, **Introducción al proyecto**, 1989,  
 PEÑA, A., **Apuntes de Proyectos: Proyectos de Ingeniería y Documento Proyecto.**, 1997,  
 GÓMEZ SENENT, E., **Las fases del proyecto y su metodología.**, 1992,  
 HEREDIA, R., **Dirección integrada de proyecto. Segunda edición**, 1995,  
 CORZO, M.A., **Introducción a la ingeniería de proyectos**, 2002,  
 TRUEBA, Y., A. CAZORLA y J.J. DE GRACIA, **Proyectos empresariales. Formulación y Evaluación**, 1995,  
 ROMERO, C, **Teoría de la decisión multicriterio: conceptos, técnicas y aplicaciones.**, 2005,  
 PIQUER, J.S, **El proyecto en ingeniería y arquitectura**, 2003,  
 ESCRIVA, I.V., J.L. PEREZ-SALAS y V. SEGURA, **Cuadro de precios. Ingeniería agronómica y alimentaria**, 1996,  
 SAPAG CHAIN, N, **Fundamentos de Preparación y Evaluación de Proyectos**, 2005,  
 MORRILLA ABAD, IGNACIO, **Guía metodológica y práctica para la realización de proyectos.**, 1998,

### Recommendations

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

Use of forests/P03G370V01601  
 Forest constructions/P03G370V01501  
 Forestry hydrology/P03G370V01604  
 Forest management/P03G370V01605  
 Repopulation/P03G370V01603

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

Physics: Physics I/P03G370V01102  
 Physics: Physics II/P03G370V01202  
 Mathematics: Overview of mathematics/P03G370V01203  
 Mathematics: Mathematics and IT/P03G370V01103  
 Botany/P03G370V01303  
 Electrotechnology and rural electrification/P03G370V01304

### Contingency plan

#### Description

=== EXCEPTIONAL PLANNING ===

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



advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===

\* Teaching on line

Use of institutional on-line teaching platform Campus Remoto in a synchronous way for the theoretical classes including basics, foundations, as well as general guidelines for resolution of problems and practical cases. Specific didactic materials adapted for on line teaching will be prepared e.g. Video or presentations, graphic resources, software, etc. All the resources will be available through FAITIC platform.

\* Mechanism face-to-face of attention to the students (tutorials)

Personalized attention. Communication by email or another on-line tool. Tutorials via Campus Remoto platform.

=== ADAPTATION OF The EVALUATION ===

On-line tests and tasks via Campus Remoto and Faitic. The weight of the tests will be maintained as they are described in the main guide.

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**IDENTIFYING DATA****Environmental Impact**

Subject	Environmental Impact			
Code	P03G370V01504			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Mandatory	3rd	1st
Teaching language	Spanish Galician			
Department				
Coordinator	Álvarez Bermúdez, Xana			
Lecturers	Álvarez Bermúdez, Xana			
E-mail	xana.alvarez.bermudez@gmail.com			
Web				
General description	(*)(*)En esta materia se trata de compatibilizar la actividad humana con el medio ambiente de tal manera que se puedan prever y prevenir los impactos que sobre los diversos factores del medio provocan determinadas actuaciones y/o actividades, tratando de minimizarlos o reducirlos.			

**Competencies**

Code	
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.
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 .
CG4	Ability to evaluate and correct the environmental impact, as well as apply the techniques of auditing and environmental management.
CE19	Ability to know, understand and use the principles of: evaluation and correction of environmental impact; recovery of degraded spaces.
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
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	CE19	CT4
3R. 2018 Be conscious of the multidisciplinary context of the engineering.	CG2		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.	CG3		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.	CG4		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.			CT10
7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.			
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.			
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.			

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## Contents

### Topic

MODULE I: GENERAL FRAME	The Environmental System
Subject 1	<input type="checkbox"/> Introduction <input type="checkbox"/> The environmental system <input type="checkbox"/> environmental Problems <input type="checkbox"/> sustainable Development and the environmental management
MODULE I: GENERAL FRAME	Basic principles of the environmental politics
Subject 2	<input type="checkbox"/> Antecedents: <input type="checkbox"/> The protocol of Kioto <input type="checkbox"/> The forests in his paper of carbon sink
MODULE I: GENERAL FRAME	Environmental programmes of action of the European Union
Subject 3	<input type="checkbox"/> 1º Program (1973-1976) <input type="checkbox"/> 2º Program (1977-1981) <input type="checkbox"/> 3º Program (1982-1986) <input type="checkbox"/> 4º Program (1987-1992) <input type="checkbox"/> 5º Program (1992-2000) <input type="checkbox"/> 6º Program (2001-2010) <input type="checkbox"/> 7º Program (2014-2020)
MODULE I: GENERAL FRAME	Environmental management and his Instruments
Subject 4	<input type="checkbox"/> Definition <input type="checkbox"/> general Principles of the environmental management <input type="checkbox"/> Instruments of environmental management <input type="checkbox"/> environmental Management in the public sector <input type="checkbox"/> Systems of Environmental Management
MODULE II: INTRODUCTION To THE ENVIRONMENTAL IMPACT	Legal and institutional frame
Subject 5	<input type="checkbox"/> Antecedents <input type="checkbox"/> Community Legislation on Normative environmental <input type="checkbox"/> evaluation Spaniard in the national field <input type="checkbox"/> autonomic Rule <input type="checkbox"/> sectorial Rule

MODULE II: INTRODUCTION To THE ENVIRONMENTAL IMPACT	Analysis and environmental value of the geographic space
Subject 6	<input type="checkbox"/> environmental <input type="checkbox"/> Variable Introduction <input type="checkbox"/> Differentiation of environmental units <input type="checkbox"/> Phases
MODULE II: INTRODUCTION To THE ENVIRONMENTAL IMPACT	Environmental impact
Subject 7	<input type="checkbox"/> Introduction <input type="checkbox"/> Hit associated to the human activities <input type="checkbox"/> Relation causes effect <input type="checkbox"/> Classes of impacts <input type="checkbox"/> Attributes of the environmental impact
MODULE II: INTRODUCTION To THE ENVIRONMENTAL IMPACT	Indicators of Environmental Impact
Subject 8	<input type="checkbox"/> Concept <input type="checkbox"/> Classification of indicators <input type="checkbox"/> Models of indicators <input type="checkbox"/> Environmental Indicators in the field of the European Union <input type="checkbox"/> Environmental Indicators in Spain
MODULE III: EVALUATION OF ENVIRONMENTAL IMPACT	Evaluation of environmental impact. Strategic evaluation
Subject 9	<input type="checkbox"/> strategic environmental Evaluation ordinary <input type="checkbox"/> strategic environmental Evaluation simplified <input type="checkbox"/> Evaluation of ordinary environmental impact <input type="checkbox"/> Evaluation of environmental impact simplified <input type="checkbox"/> environmental Evaluation of activities
Module IV: CORRECTION OF ENVIRONMENTAL IMPACTS	Corrector measures, protective and compensatory
Subject 10	
Module IV: CORRECTION OF ENVIRONMENTAL IMPACTS	Program of Environmental Surveillance Document of Synthesis
Subject 11	
Module IV: CORRECTION OF ENVIRONMENTAL IMPACTS	environmental impact assessment and eco-audits (comparison)
Subject 12	
Module V: PRACTICAL CASES	Practical cases
Subject 13	

<b>Planning</b>			
	Class hours	Hours outside the classroom	Total hours
Case studies	30	0	30
Mentored work	60	0	60
Lecturing	40	17	57
Objective questions exam	1	0	1
Essay	2	0	2

\*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
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.
Mentored work	Students develop exercises or classroom projects under the guidance and supervision of the teacher. May link autonomous development of student activities.
Lecturing	Theory sessions by the teacher

<b>Personalized assistance</b>	
Methodologies	Description

Mentored work	Resolution of doubts raised
Case studies	Resolution of doubts raised
Lecturing	Resolution of doubts raised
<b>Tests</b>	<b>Description</b>
Objective questions exam	Resolution of doubts raised
Essay	Exam of the taught syllabus

<b>Assessment</b>			
	Description	Qualification	Evaluated Competences
Objective questions exam	It makes one tests type test and of long answer at the end of the subject to way of final examination on the content of the *temario that have developed in the course and on the matters of the visits and practices evaluate the basic competitions *CB1 and *CB2, the generals *CG6, *CG7, *CG8, *CG9, *CG13, *CG14, *CG17, *CG18 and *CG19, the specific *CE19 (*CE 19.1 to 19.19) and the transversal *CT1, *CT2, *CT11, *CT14, *CT15 and *CT20	50	
Essay	The work presented will have to have an important part of technical content and will value his innovation regarding thematic and development, His evaluation will be included in the study of cases. The additional assessment will be consequence of the obtaining of the aims posed initially Evaluate the basic competitions *CB1 and *CB2, the generals *CG6, *CG7, *CG8, *CG9, *CG13, *CG14, *CG17, *CG18 and *CG19, the specific *CE19 (*CE 19.1 to 19.19) and the transversal *CT1, *CT2, *CT11, *CT14, *CT15 and *CT20	50	

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

Official dates and any modification will be accesible in the official notice board and in the web page <http://forestaes.uvigo.es/gl/>

### **Sources of information**

#### **Basic Bibliography**

#### **Complementary Bibliography**

### **Recommendations**

### **Contingency plan**

#### **Description**

=== EXCEPTIONAL MEASURES SCHEDULED ===

In front of the uncertain and unpredictable evolution of the sanitary alert caused by the \*COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide \*antelación) by the students and the \*profesorado through the tool normalised and institutionalised of the educational guides.

=== ADAPTATION OF THE METHODOLOGIES ===

\* educational Methodologies that keep

The educational methodology will be the same, simply that will change the \*face to face class by the virtual modality.

\* Educational methodologies that modify :

In the schedules established in the official calendars of the centre, will give sessions through the platform of the University of Vigo (remote campus)

\* Mechanism no face-to-face of attention to the students (\*tutorías):

The individual sesions will make through the virtual office of each professor (Xana Álvarez: room 71). The student will send a

mail previously to agree the day and time

\* Modifications (if they proceed) of the contents to give: they keep

\* additional Bibliography to facilitate the car-learning: it will leave available in fatic

\* Other modifications

=== ADAPTATION OF THE EVALUATION ===

\* Test already made

Tests type test: [previous Weight 70%] [Weight Proposed 70%]

weekly Exposition: [previous Weight 70%] [Weight Proposed 70%]

...

\* Pending proofs that keep

Tests type test: [previous Weight 70%] [Weight Proposed 70%]

weekly Expositions: [previous Weight 70%] [Weight Proposed 70%]

...

\* Proofs that modify : they do not modify , only they will make of virtual form in place of face-to-face  
[previous Proof] => [new Proof]

\* New proofs: no

\* additional Information

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**IDENTIFYING DATA****Forest certification and legislation**

Subject	Forest certification and legislation			
Code	P03G370V01505			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Mandatory	3rd	1st
Teaching language				
Department				
Coordinator	Álvarez Bermúdez, Xana			
Lecturers	Álvarez Bermúdez, Xana			
E-mail	xana.alvarez.bermudez@gmail.com			
Web	http://www.faitic.uvigo.es			
General description	(*)Los futuros técnicos forestales deben conocer la legislación que les afecta y para ello deben conocer desde el inicio los procesos de tramitación y los Organismos que legislan y ejecutan las leyes.			

**Competencies**

Code	
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.
CE25	Ability to know, understand and use the principles of: forest legislation and certification; sociology and forestry policy.
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
CT9	Teamwork skills, skills in interpersonal relationships and leadership.
CT10	Autonomous Learning

**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.	CG1	CE25	CT4
3R. 2018 Be conscious of the multidisciplinary context of the engineering.	CG2		CT5
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.	CG10		CT6
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.			CT8
12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.			CT9
14R. 2018 Capacity to apply norms of engineering in the his speciality.			CT10
15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering.			
17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions			
20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines.			
21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life.			
22R. 2018 Capacity to be to the day of the scientific and technological news.			

**Contents**

Topic

BASIC LEGISLATION I

- 1.- Right: The concept of law, Classification, sources and basic principles in Spanish legal framework.
- 2.- Spanish Constitution: Study as a whole, Principles, spanish constitution, reform constitutional.
- 3.- Congress and Senate: Elaboration of laws, Electoral law, prerogatives of Members and Senators, the congress of deputies (Composition, election, mandate, duration, Functions, etc.), the senate (composition, election, Mandate, duration, functions, etc.).
- 4.- Galician Parliament: Background, Parliamentary study as a whole, initiative Legislation, competition from Galicia, Galicia, sources of autonomic law.
- 5.- The European Union: Objectives of the U.E., Evolution, institutions, sources and principles.
- 6.- Organization of the state: Municipalities, Provinces and autonomous communities.
- 7.- Judicial branch and other institutions: Introduction, division of powers, defender of Town, general council of the judiciary, Courts, hearing and other institutions.
- 8.- Relations between citizens and Public administrations: Introduction, law Administrative, administrative act, classes, phases Of the procedure, administrative remedies. The Law of administrative procedure.

LEGISLATION II

- 9.- Contracts Law: Classes, forms of contracting, Content and effects of contracts Administrative, compliance with contracts Administrative, resolution, termination and resignation.
- 10.- Forest property: Concept of property, Legal concept of the hill, classification of the hill.
- 11.- Law of mountains: Complete study of the Law Forest fires (43/2003 and 10/2006).
- 12.- Development of the law at the regional level: Proposed draft of the new Mountains of Galicia.
- 13.- Neighborhood forests in common hand: Legislation, concept, characteristics, process Legalization, organization, statutes, administration.
- 14.- Other forest-related laws: Fires. Law of the land bank of Galicia, Decree of the Units of Forest Management.
- 15.- Hunting and fishing legislation. Law of Conservation of biodiversity. Legislation of Natural spaces and conservation of Nature (Natura 2000 Network) and environment. Law of landscape, etc.

FOREST CERTIFICATION

- 16.- The protection of forests in the world After the 1992 Rio Summit.
- 17.- International Management Initiatives Sustainable Forestry.
- 18.- Ministerial Conferences for the Protection of forests in Europe.
- 19.- Other global processes: Montreal, Tarapoto, dry Africa, etc.
- 20.- Sustainable Forest Management.
- 21.- Forest certification: Processes and Initiatives.
- 22.- Criteria and indicators.
- 23.- UNE 162,000 standards in Spain
- 24.- Current systems more implemented: PEFC and FSC.
- 25.- Practical forms of forest certification.

**Planning**

	Class hours	Hours outside the classroom	Total hours
Case studies	45	19	64
Presentation	45	15	60
Lecturing	12	10	22
Objective questions exam	1	0	1
Presentation	3	0	3

\*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
Case studies	Individual preparation or by couples of a subject chosen inside the contents of the program for the preparation of a situation or concrete case that it will be presented and evaluated by the mates at the end of the course. They develop the basic competitions *CB1 and *CB2, the generals *CG08, *CG09 and *CG3, the specific *CE25 and the transversal *CBI1, *CBI2, *CBP4, *CBS2, *CBS3 and *CBS 8.
Presentation	They will develop presentations by part of the student of the subjects assigned previously in class
Lecturing	Exposition by the professor

### **Personalized assistance**

<b>Methodologies</b>	<b>Description</b>
Case studies	They will make reviews and debates on subjects of actuality
Presentation	They will develop presentations by part of the student of the subjects assigned previously in class
<b>Tests</b>	<b>Description</b>
Presentation	They will develop presentations by part of the student of the subjects assigned previously in class

<b>Assessment</b>				
	Description	Qualification	Evaluated Competences	
Objective questions exam	It makes one tests type test at the end of the subject to way of final examination on the content of the *temario that have developed in the course and on the matters of the visits and practical. *evaluan The basic competitions *CB1 and *CB2, the generals *CG08, *CG09 and *CG3, the specific *CE25 (*CE 25.1 to 25.19) and the transversal *CBI1, *CBI2, *CBP4, *CBS2, *CBS3 and *CBS 8.	50	CE25	CT5 CT10
Presentation	They will make weekly presentations of the subjects assigned previously	50	CE25	CT5 CT6 CT8 CT9 CT10

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

#### **Sources of information**

##### **Basic Bibliography**

##### **Complementary Bibliography**

### **Recommendations**

### **Contingency plan**

#### **Description**

=== EXCEPTIONAL MEASURES SCHEDULED ===

In front of the uncertain and unpredictable evolution of the sanitary alert caused by the \*COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide \*antelación) by the students and the \*profesorado through the tool normalised and institutionalised of the educational guides.

=== ADAPTATION OF THE METHODOLOGIES ===

\* educational Methodologies that keep

keeps the subjects and the methodology of weekly exposition by students

\* educational Methodologies that modify

will change from the face-to-face modality to the virtual through the virtual campus.

\* Mechanism no face-to-face of attention to the students (\*tutorías): through email and of the virtual dispatch of the professor

\* Modifications (if they proceed) of the contents to give: without modifications

\* additional Bibliography to facilitate the car-learning: without modifications

\* Other modifications

=== ADAPTATION OF THE EVALUATION ===

\* Test already made: they keep

Proof XX: [previous Weight 00%] [Weight Proposed 00%]

...

\* Pending proofs that keep : all are supported by the same weight

Tests XX: [previous Weight 00%] [Weight Proposed 00%]

...

\* Proofs that modify : there are not modifications

[previous Proof] > [new Proof]

\* New proofs: they will not make new test

\* additional Information

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**IDENTIFYING DATA****Use of forests**

Subject	Use of forests			
Code	P03G370V01601			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Mandatory	3rd	2nd
Teaching language	Spanish			
Department				
Coordinator	Ortiz Torres, Luis			
Lecturers	Ortiz Torres, Luis			
E-mail	lortiz@uvigo.es			
Web	<a href="http://http://dasometriaweb.blogspot.com.es/">http://http://dasometriaweb.blogspot.com.es/</a>			
General description	(*)Se analizarán los fundamentos básicos de los aprovechamientos forestales madereros para aprender su planificación básica. Asimismo se estudiarán los principales sistemas de aprovechamiento usados en Galicia así como sus rendimientos, costes y normas de seguridad.			

En la enseñanza de la materia, tres aspectos son fundamentales a desarrollar, según nuestro punto de vista, en la enseñanza de la ciencia forestal: intuición, rigor y creación. La intuición ubica al alumno en el tipo de problemas que se quiere atacar (a través de ejemplos), crea una perspectiva (a menudo a través de la propia historia del problema) y en definitiva genera un interés. El segundo nivel formaliza todas esas intuiciones y las despoja de lo accesorio hasta desentrañar lo esencial. El rigor necesita de la abstracción y es fundamental en la transmisión de conocimientos técnicos. La creación permite construir soluciones propias, prácticas, cuanto antes tenga un contacto forestal y más aprenda de ello, más motivado va a continuar el estudio de la asignatura.

**Competencies**

## Code

- 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.
- CG6 Ability to measure, inventory and evaluate forest resources, apply and develop silvicultural techniques and management of all types of forest systems, parks and recreational areas, as well as techniques for harvesting timber and non-timber forest products
- CE23 Ability to know, understand and use the principles of forest exploitation and supply of raw materials in the forest industry.
- 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
- CT10 Autonomous Learning

**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.	CG1 CG6	CE23	CT4 CT5 CT6 CT8 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.			
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.			
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.			
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

General information on forestry and its market in the world	Definition and types of use The Forest Products Market The demanda and the companies The supply of forest products in the world
Marketing of wood	Main procedures for the sale and sale of wood Auction and drafting
Techniques, means and procedures of logging	Wood felling and processing Manual tools The chainsaw and other portable machines Automotive Fodder and Processing Machinery Waste treatment machinery (chippers and balers) Pull out of the wood (skider and autoloader) Adapted agricultural tractor Unblocking cables, helicopter and other methods Transport of wood (river, rail, sea and land) Parks for wood storage
Timber harvesting planning	Factors influencing planning Main systems of exploitation Organization of the uses Control systems in the harvests
Prevention of occupational hazards in forestry	The risk assessment Loss in the forestry sector
The environmental impact of harvesting	Main impacts of forestry activity Methodological guide
The use of bark	Cork Ecology The cork market
The use of resins	The use of resins The resin market

## Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	26	63	89
Problem solving	3	11	14

Case studies	6	6	12
Studies excursion	16	18	34
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	Presentation by the teacher of the contents on the subject under study, theoretical and / or guidelines for a job, exercise or project to be developed by the student.
Problem solving	Activity which formulated problem and / or exercises related to the course. The student should develop appropriate solutions or right through the exercise routines, application of formulas or algorithms, application processing procedures available information and interpretation of the results. It is often used to complement the lecture.
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.
Studies excursion	Activities application of knowledge to specific situations and basic skills acquisition and related procedural matter under study. They thrive in nonacademic outdoor spaces. Among them we can cite practical field visits to events, research centers, companies, institutions ... academic-professional interest to the student.

## Personalized assistance

Methodologies	Description
Problem solving	It is a question of performing a practical work corresponding to a gap in the topics included in the agenda and publicly presenting said work.
Studies excursion	It is a series of practical visits to facilities and mountains

## Assessment

	Description	Qualification	Evaluated Competences
Lecturing	(*)Asistencia e desempeño dedicado ás clases da materia. Se *evaluan as competencias básicas *CB1 e *CB2, as xerais *CG8, *CG18, *CG23, *CG38, *CG39, *CG40 e *CG41, a específicas CE23 (CE 23.1 a 23.10) e as transversais *CBI1, *CBI2, *CBI4, *CBI5, *CBI6, *CBI7, *CBP4, *CBS1, *CBS7.	10	
Case studies	(*)Resolución dun suposto práctico de planificación que o alumno deberá realizar e entregar Se *evaluan as competencias básicas *CB1 e *CB2, as xerais *CG8, *CG18, *CG23, *CG38, *CG39, *CG40 e *CG41, a específicas CE23 (CE 23.1 a 23.10) e as transversais *CBI1, *CBI2, *CBI4, *CBI5, *CBI6, *CBI7, *CBP4, *CBS1, *CBS7.	20	CT5 CT6
Studies excursion	(*)Asistencia ás saídas e práctica de campo organizadas.	10	
Problem and/or exercise solving	(*)Resposta a preguntas relacionadas co temario Se *evaluan as competencias básicas *CB1 e *CB2, as xerais *CG8, *CG18, *CG23, *CG38, *CG39, *CG40 e *CG41, a específicas CE23 (CE 23.1 a 23.10) e as transversais *CBI1, *CBI2, *CBI4, *CBI5, *CBI6, *CBI7, *CBP4, *CBS1, *CBS7.	60	CT6

## Other comments on the Evaluation

### Sources of information

#### Basic Bibliography

#### Complementary Bibliography

TOLOSANA, E. et al, **El aprovechamiento maderero**, Ediciones Mundi-Prensa,  
DALLA-PRIA, E et al, **Manuel d'exploitation forestière. Tome I.et II**, CTBA y ARMEF,  
MONTOYA, J. M., **Los alcornoques**, M.A.P.A. Madrid,  
ZAMORANO, J. L, **Resinar de forma rentable**, I.N.I.A. Madrid,  
ACEMM, **Manual de prevención de riesgos laborales en el sector forestal**, Fundación para la prevención de riesgos laborales. Gobierno de Cantabria,  
AAEF, **Manual de prevención de riesgos laborales en el sector forestal**, Junta de Andalucía,

### Recommendations

#### Subjects that continue the syllabus

Forestry machinery/P03G370V01502

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

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Dasometry/P03G370V01602

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

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Forestry/P03G370V01401

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**Contingency plan**

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**Description**

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=== EXCEPTIONAL PLANNING ===

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

=== ADAPTATION OF THE METHODOLOGIES ===

\* Teaching on line

Use of institutional on-line teaching platform Campus Remoto in a synchronous way for the theoretical classes including basics, foundations, as well as general guidelines for resolution of problems and practical cases. Specific didactic materials adapted for on line teaching will be prepared e.g. Video or presentations, graphic resources, software, etc. All the resources will be available through FAITIC platform.

\* Mechanism face-to-face of attention to the students (tutorials)

Personalized attention. Communication by email or another on-line tool. Tutorials via Campus Remoto platform.

=== ADAPTATION OF The EVALUATION ===

On-line tests and tasks via Campus Remoto and Faitic. The weight of the tests will be maintained as they are described in the main guide.

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**IDENTIFYING DATA****Dasometry**

Subject	Dasometry			
Code	P03G370V01602			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Mandatory	3rd	2nd
Teaching language	Spanish Galician			
Department				
Coordinator				
Lecturers				
E-mail				
Web				

**General description** The \*asignatura of \*Dasometría consists of two big blocks: \*Dasometría and Inventory.

The first a forest basic science part of the \*Dasonomía and very related with the \*Selvicultura that centres in the study of the volumes and growths of the forest masses.

The second is a group of technicians that allow to the technician in his professional work apply the sciences (\*Dasometría) for \*recopilar data on the masses and possible future evolution.

In the education of the matter, three appearances are fundamental to develop, according to our point of view, in the education of the forest science: intuition, rigour and creation. The intuition situates to the student in the type of problems that wants to attack (through examples), creates a perspective (often through the own history of the problem) and in definite generates an interest. The second level formalises all these intuitions and undresses them of the accessory until \*desentrañar the essential. The rigour needs of the abstraction and is fundamental in the transmission of technical knowledges. The creation allows to build own solutions, practical, what before have a forest contact and more learn of this, more motivated goes to continue the study of the \*asignatura.

**Competencies**

Code	
CG6	Ability to measure, inventory and evaluate forest resources, apply and develop silvicultural techniques and management of all types of forest systems, parks and recreational areas, as well as techniques for harvesting timber and non-timber forest products
CE24	Ability to know, understand and use the principles of: dasometry and forest inventory, forest management.
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. CG6 CE24 CT8
- 3R. 2018 Be conscious of the multidisciplinary context of the engineering.
- 4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental \*relevantes of form \*relevante and interpret correctly the results of these analyses.
- 5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.
- 6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.
- 7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.
- 8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.
- 9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.
- 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.
- 22R. 2018 Capacity to be to the day of the scientific and technological news.

## Contents

### Topic

0. Introduction to the Dasometry	<ol style="list-style-type: none"> <li>1. Why measure?</li> <li>2. Why measure trees and forest masses?</li> <li>3. Dasometry and affine sciences.</li> <li>4. Units of measure.</li> <li>5. Normalisation of symbols used in dasometry.</li> <li>6. Significant figures.</li> <li>7. Precision, bias and accuracy of the data.</li> <li>8. Errors.</li> <li>9. Weight or volume?</li> <li>10. Components of the tree.</li> <li>11. The form of the tree.</li> <li>12. Measurement by trip of fluid.</li> <li>13. Differences between quantity, value and price.</li> </ol>
1. Measurement of Trees: Diameters	<ol style="list-style-type: none"> <li>1.1. Important terms.</li> <li>1.2. Basic dasometric parameters.</li> <li>1.3. Measurement of diameters of the trees.</li> <li>1.4. Measurement of the thickness of bark, diametral growth and age of the tree.</li> <li>1.5. Marked and designation of trees.</li> <li>1.6. Measurement of distances.</li> </ol>
2. Measurement of Trees: Heights	<ol style="list-style-type: none"> <li>2.1. Measurement of slopes.</li> <li>2.2. Measurement of heights.</li> <li>2.3. Recommendations for the measurement of heights.</li> <li>2.4. Relascopio Of Bitterlich.</li> <li>2.5. Other devices of the inventory.</li> <li>2.6. Price devices dasometrycs.</li> </ol>
3. Cubiculation By trozas.	<ol style="list-style-type: none"> <li>3.1. Cubiculation Of trees.</li> <li>3.2. Types dendrométricos.</li> <li>3.3. Procedures for cubages of trees.</li> <li>3.4. Formulas for cubages by trozas.</li> <li>3.5. Rules madereras.</li> </ol>
4. Cubages Complete trunks.	<ol style="list-style-type: none"> <li>4.1. Graphic method.</li> <li>4.2. Function of profile.</li> <li>4.3. Formula of Pressler or of the point guideline.</li> <li>4.4. Cubages Of trees in foot. Pressler-Bitterlich.</li> <li>4.5. Parameters related with form: coefficients of form and mórphics..</li> <li>4.6. Height reduced.</li> </ol>



5. Cubiculation Of masses.	5.1. Stereometry. 5.2. Function of distribution diametric. 5.3. Half parameters of a mass. 5.4. Cubification Of forest masses. 5.5. Prices or tables of cubiculation. 5.6. Tables of mass. 5.7. Trees Type or modular values.
6. Wooden measurement stacked.	6.1. Quantification of the wood stacked. Definition of stereo. 6.2. Other units of apparent volume. 6.3. Coefficient of stacked. 6.4. Methods to calculate the coefficient of stacked.
7. Epidometry	7.1. Definition of epidometry 7.2. Diametral growth and age of the tree. 7.3. Analysis epidometric of trunks. 7.4. Definitions of growth. 7.5. Relation between growths. 7.6. Methods of obtaining of growths. 7.7. Definitions of growth of a mass.
8. Forest inventory	8.1. Definition of inventory. 8.2. Parts of the inventory. 8.3. Types of inventory. 8.4. Planning of the inventory. 8.5. Design of the inventory. 8.6. Units of sampling. 8.7. Methods of sampling. 8.8. Number, size and form of the plots of sampling. 8.9. Methods of realisation of the inventory. 8.10. Determination of the number of sample for a determinate error. 8.10. Estadillos Of taking of data in field.

### Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	26	52	78
Problem solving	4	10	14
Case studies	6	12	18
Studies excursion	14	21	35
Problem and/or exercise solving	1	0	1
Report of practices, practicum and external practices	1	0	1
Self-assessment	0	3	3

\*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 by part of the professor of the contents on the matter supporting some presentations of images, diagrams and videos that the student can see/download in the web indicated by the professor
Problem solving	I complement of the master lessons in which they expose practical exercises that the student has to develop applying the algorithms seen in the subject.
Case studies	Study of real cases with examples of different Inventories realised analysing his memory and methodology. With special attention to the solutions of planning employed and the computer applications.
Studies excursion	They will realise three practical exits for the execution of a forest inventory previously designed in the classroom like practical case. The students will have of the material of necessary inventory for the take down of plots and his processed back in cabinet. It will have to present a memory of the inventory realised.

### Personalized assistance

Methodologies	Description
Problem solving	
Studies excursion	

### Assessment

	Description	Qualification	Evaluated Competences
Lecturing	Assistance and participation in the theoretical classes of the *asignatura (7.5 points). Delivery of exercises realised during the classes or of realisation out of the classroom (10 points) .	20	CE24
Problem and/or exercise solving	Realisation of an examination in which they will evaluate the theoretical and practical concepts of the *asignatura, by means of questions type test, and of theoretical development, as well as practical exercises.	60	CE24
Report of practices, practicum and external practices	COMPULSORY assistance to the practical classes of the *asignatura, that realise usually in field. In exceptional cases, in which the assistance continued of the student was not possible, will realise a practical examination in field. COMPULSORY assistance to trip of practices of the *asignatura.	20	CE24
Self-assessment	(*)Realización de ejercicios exemplo e casos prácticos como apoio ao estudante	0	

### Other comments on the Evaluation

The student has to approve the practical part and the theoretical part separately. The assistance to the practices and to the trip of practices is of compulsory character to approve the \*asignatura.

### Sources of information

#### Basic Bibliography

#### Complementary Bibliography

DIEGUEZ, U. et al., **Dendrometría**, Mundi Prensa □ Fundación Conde del Valle de Salazar,

MARTÍNEZ CHAMORRO, et al., **Manual para a cubicación, taxación e venda de madeira en pe e biomasa forestal**, Universidade de Vigo,

MADRIGAL, A.; ÁLVAREZ, J.G.; RODRÍGUEZ, R.; ROJO, A., **Tablas de producción para los montes españoles**, Fundación Conde del Valle de Salazar,

DIEGUEZ, U. et al., **Herramientas Selvícolas para la Gestión Forestal Sostenible en Galicia**, Xunta de Galicia,

PRIETO RODRÍGUEZ, A.; LÓPEZ QUERO, M., **Dasometría. Versión española de □Dendrométrie de L'école national du génie rural des aux et des forêts**□, Editorial Paraninfo,

ACEMM, **Manual de prevención de riesgos laborales en el sector forestal**, Fundación para la prevención de riesgos laborales. Gobierno de Cantabria,

### Recommendations

#### Subjects that continue the syllabus

Forest management/P03G370V01605

Physical planning and land management/P03G370V01701

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

Projects/P03G370V01503

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

Mathematics: Statistics/P03G370V01301

Forestry/P03G370V01401

Use of forests/P03G370V01601

### Contingency plan

#### Description

=== EXCEPTIONAL PLANNING ===

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

=== ADAPTATION OF THE METHODOLOGIES ===

\* Teaching methodologies maintained

\* Teaching methodologies modified

\* Non-attendance mechanisms for student attention (tutoring)

\* Modifications (if applicable) of the contents

\* Additional bibliography to facilitate self-learning

\* Other modifications

=== ADAPTATION OF THE TESTS ===

\* Tests already carried out

Test XX: [Previous Weight 00%] [Proposed Weight 00%]

...

\* Pending tests that are maintained

Test XX: [Previous Weight 00%] [Proposed Weight 00%]

...

\* Tests that are modified

[Previous test] => [New test]

\* New tests

\* Additional Information

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**IDENTIFYING DATA****Repopulation**

Subject	Repopulation			
Code	P03G370V01603			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	3rd	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	González Prieto, Óscar			
Lecturers	González Prieto, Óscar			
E-mail	oscargprieto@uvigo.es			
Web				
General description	(*)Los objetivos generales de la asignatura son: a) Conocer las bases, objeto y fundamentos de las Repoblaciones Forestales b) Conocer las características, métodos y medios necesarios para llevar a cabo las distintas operaciones relacionadas con las repoblaciones forestales c) Conocer los principios generales de la obtención de semilla forestal y producción de planta forestal en vivero.			

**Competencies**

Code	
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.
CE20	Ability to know, understand and use the principles of forestry machinery and mechanization.
CE21	Ability to know, understand and use the principles of: reforestation. Gardening and nurseries. Forest improvement
CT5	Capacity for information management, analysis and synthesis
CT8	Ability to solve problems, critical reasoning and decision making
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	CE20	CT5
3R. 2018 Be conscious of the multidisciplinary context of the engineering.	CG2	CE21	CT8 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.			
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.			
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.			

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## Contents

Topic

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Module I \*Planificación and \*ejecución of  
\*replantaciones forest

Subject 1. Concept and election of species  
 Lesson 1.1. Concept of \*replantación forest and comment  
 Lesson 1.2. Antecedents and need of the \*replantación forest  
 Lesson 1.3. Aims of the \*replantación forest  
 Lesson 1.4. Election of species

Fear 2. Methods of \*replantación  
 Lesson 2.1. Types of methods  
 Lesson 2.2. Selection of the method

Fear 3. Treatment of the pre-existing vegetation  
 Lesson 3.1. Justification and objective  
 Lesson 3.2. Classification of the procedures of \*desbroce  
 Lesson 3.3. Description of the procedures of \*desbroce

Subject 4. Preparation of the am used to  
 Lesson 4.1. Justification and objective  
 Lesson 4.2. Classification of the procedures of preparation of the am used to  
 Lesson 4.3. Description of the procedures of preparation of the am used to  
 Lesson 4.4. Hydrological appearances of the \*desbroces and of the preparation of the floor

Fear 5. Introduction of the new species  
 Lesson 5.1. Density of introduction  
 Lesson 5.2. You seed  
 Lesson 5.3. Plantations

Fear 6. Back cares of the \*replantaciones and complementary works  
 Lesson 6.1. Back cares of the \*replantaciones  
 Lesson 6.2. Complementary works

Subject 7. Environmental impact of the \*replantaciones forest  
 Lesson 7.1. Introduction and normative  
 Lesson 7.2. Considerations on the environmental impact of the \*R. Forest  
 Lesson 7.3. Factors affected  
 Lesson 7.4. Evaluation of impacts  
 Lesson 7.5. Methodological conclusion

Module II Seeds

Subject 8. Generalities on forest seeds  
 Lesson 8.1. \*Recolección  
 Lesson 8.2. Extraction and cleaning  
 Lesson 8.3. Storage  
 Lesson 8.4. Treatments of conservation  
 Lesson 8.5. Analysis  
 Lesson 8.6. Treatments of germination  
 Lesson 8.7. It seeds

Module III Nurseries

Subject 9. Generalities on forest nurseries  
 Lesson 9.1. Definition and classes  
 Lesson 9.2. It waters  
 Lesson 9.3. I am used to  
 Lesson 9.4. Location, form and size  
 Lesson 9.5. Crop of plant to nude root  
 Lesson 9.6. Crop of plant in container  
 Lesson 9.7. \*Estaquillado  
 Lesson 9.8. Quality of the forest plant  
 Lesson 9.9. \*Micorrización

Module IV Security, Hygiene and Prevention of  
labour Risks in the \*replantaciones forest

Element 10 \*PRL in \*Replantaciones Forest  
 \*Lección 10.1 Risks related with the spaces of work  
 \*Lección 10.2 manual Tools  
 \*Lección 10.3 portable Machines  
 \*Lección 10.4 forest Machinery  
 \*Lección 10.5 Manipulation of phytosanitary products  
and \*fertilizantes

## Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	15	48	63

Problem solving	6	14	20
Studies excursion	8	8	16
Project based learning	4	13	17
Case studies	11	15	26
Objective questions exam	1.5	0	1.5
Problem and/or exercise solving	1.5	0	1.5
Laboratory practice	5	0	5

\*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
Lecturing	<p>The lesson *magistral is the common form of development of the function *expositiva, in that the professor develops a series of concepts related with the contents of the Subject, and the student adopts a paper *receptivo of said information.</p> <p>The employment of audiovisual means (slides, transparencies, videos, cannon of video, etc.) goes to be constant in these classes since the retention of information is very upper when they combine oral and visual stimuli.</p> <p>The lesson *magistral serves to develop conceptually a subject, give global versions, develop a methodology of work. Etc.</p> <p>In function of the advance of the course, the content of each didactic unit given will go facilitating previously and by writing, well as you aim or like bibliography, what makes possible to the student that assist to the classes with the previous reading of the subject. On the other hand, if the student knows that what gives will be able to find it in a book to the hour to study it, his attitude in class will be headed to to comprise the explanation, having to take only notice *marginales of what expands .</p> <p>In the case of the present subject, the employment of audiovisual means like digital presentations, multimedia, transparencies, *retroproyección, etc. has to speed up the exhibition of subjects with a marked descriptive character, or in which they require drawings and diagrams of complicated execution.</p> <p>The classes of discussion directed, will make at least one along the course and consists in the exhibition of a subject, that has to gather characteristics of real problem, wealth in contradictions or reasons of controversy, has to be of interest for the students, that have to know the activity with *antelación sufficient and be the quite qualified to issue opinions about the same.</p> <p>The technician orients to the *superación of the memorisation *acrítica, the promotion of the participation in the group and the *verbalización of ideas like half that favours his assimilation. Besides, it ascertains in an important part of the students a difficulty of expression and editorial, that can contribute to win by means of this didactic resource. The paper of the professor like driver or *moderador of the discussion is fundamental allowing all type of opinions on the subject.</p> <p>Besides, and of complementary form to the lesson *magistral, after the exhibition of controversial subjects or of special interest for the students, results interesting the organisation of debates of extension reduced, turns of questions, etc. Such activity, of realisation simpler than the previous, can consider more like a resource of preparation and control inside the lesson *magistral, that like a technician of extraneous nature to the same.</p> <p>Other tools that contribute to reinforce the included contents in the lessons *magistrales are.</p> <ul style="list-style-type: none"> <li>- Study of cases/analysis of situations /discussion directed: Formulation, analysis, resolution and debate of a problem or exercise related with the thematic of the subject.</li> <li>- Resolution of problems and/or exercises of autonomous form: Formulation, analysis, resolution and debate of a problem or exercise related with the thematic of the subject, by part of the students.</li> <li>- Presentations/exhibitions: oral Exhibition by part of the students of a concrete subject or of a work (generally previous presentation written).</li> <li>- Multimedia sessions: Employment of material *videográfico / on-line on appearances of the subject</li> <li>- Gone out of practical/study of field: Realisation of visits-exits to the field for the observation and study of appearances previously studied/analysed</li> </ul>
Problem solving	<p>Formulation, analysis, resolution and debate of a problem or exercise related with the thematic of the subject, by part of the students.</p> <p>Will carry out exercises and problems on subjects as, static study of forest masses, dynamic study of the forest masses, etc.</p>

Studies excursion	The practice of the technicians, learnt theoretically, has to carry out in contact with the professional practice that only can obtain by means of the real practice of the technicians (or his direct observation) there where these carry out (industry, forest masses, etc.). Have to make the maximum number of practices of field or trips of practices, without which the theoretical educations result insufficient to achieve the educational aims. The practices of field pretend therefore achieve fix the concepts of the subject, give to the students the opportunity to put in contact with the professional world and boost the relations between students and professor student out of the centre. The realisation of trips of practices have felt when really they contribute new knowledges that they are impossible to purchase in the own School. The exit of field will not make in the case of teaching no face-to-face or *semi-face-to-face. In this case of *substituirá by the practical observation of audiovisual material of works and field of *replantaciones forest.
Project based learning	- *Organización Of seminars *ou specific conferences - Presentations/exhibitions: oral Exhibition by part of the students of a concrete subject or of a work (generally previous presentation written). - Multimedia sessions: Employment of material *videográfico / on-line on appearances of the subject - Days of study of appearances previously studied/analysed in the exits of field
Case studies	- Study of cases/analysis of situations or discussion directed: Formulation, analysis, resolution and debate of a problem or exercise related with the thematic of the subject.

### Personalized assistance

Methodologies	Description
Case studies	The *tutorías will make preferably by telematic means (email, remotecampus, forums of doubts in *FaiTIC). For that student or student that request it will be able to make , inthe measure of the possible, *presencialmente. They will indicate to beginning of course the concrete forms ofcommunication as well as the schedules.
Problem solving	The *tutorías will make preferably by telematic means (email, remotecampus, forums of doubts in *FaiTIC). For that student or student that request it will be able to make , inthe measure of the possible, *presencialmente. They will indicate to beginning of course the concrete forms ofcommunication as well as the schedules.
Studies excursion	The *tutorías will make preferably by telematic means (email, remotecampus, forums of doubts in *FaiTIC). For that student or student that request it will be able to make , inthe measure of the possible, *presencialmente. They will indicate to beginning of course the concrete forms ofcommunication as well as the schedules.

### Assessment

	Description	Qualification	Evaluated Competences
Lecturing	Proof written on the teaching given in sessions *magistrales	0	
Project based learning	Proof on learning based in projects	0	
Case studies	Proof written and/or oral on the similar cases to the resolved in class	30	CE21
Objective questions exam	Proof written on the teaching given in sessions *magistrales	30	CE21
Problem and/or exercise solving	Proof written on the teaching given in sessions *magistrales	40	CE21

### Other comments on the Evaluation

To approve the matter have to surpass the common examinations and make satisfactorily the works that \*eventualmente commission . The presence in practise and trips is compulsory. They will not save classifications of the theoretical notes, further of the announcements regulated of the academic year.

Calendar of examinations:

official Dates collected in informative documentation of the School.&#x2013;<http://forestales.uvigo.es/gl/docencia/exames/>

### Sources of information

#### Basic Bibliography

#### Complementary Bibliography

R. Serrada, **SERRADA, R. 2000. Apuntes de Repoblaciones Forestales.**, FUCOVASA. Madrid.,

### Recommendations



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

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Botany/P03G370V01303

Forestry Ecology/P03G370V01402

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

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Biology: Plant Biology/P03G370V01201

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**Contingency plan**

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**Description**

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=== EXCEPTIONAL MEASURES SCHEDULED ===

In front of the uncertain and unpredictable evolution of the sanitary alert caused by the \*COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide \*antelación) by the students and the \*profesorado through the tool normalised and institutionalised of the educational guides.

\* Educational methodologies that keep  
introductory Activities

Lesson \*magistral

Resolution of problems

Work \*tutelado

\* educational Methodologies that modify

The exit of practices scheduled will not make in the case of teaching no face-to-face or in the case that it do not allow with teaching \*semi-face-to-face. \*substituirá By practical observation of audiovisual material of processes of manufacture of industries of the wood (videos and digital information)

\* Mechanism no face-to-face of attention to the students (\*tutorías)

virtual Dispatch, email and habilitation of forums in the platform \*FaiTIC

\* Modifications (if they proceed) of the contents to give

The exit of practices scheduled will not make in the case of teaching no face-to-face or in the case that it do not allow with teaching \*semi-face-to-face. \*substituirá By practical observation of audiovisual material of processes of manufacture of industries of the wood (videos and digital information)

\* additional Bibliography to facilitate the car-learning

is not necessary, since they facilitate it to him materials in the platform of \*teledocencia, many of them of own preparation by part of the professors, to be able to make a follow-up of the matter

\* Other modifications

is not necessary

=== ADAPTATION OF THE EVALUATION ===

\* Test already made

keeps the weight when being adapted all the proofs to any circumstance

\* Test slopes that keep

keeps the weight when being adapted all the proofs to any circumstance

\* Test that they modify

is not necessary

\* New proofs

is not necessary

\* additional Information

does not require

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**IDENTIFYING DATA****Forestry hydrology**

Subject	Forestry hydrology			
Code	P03G370V01604			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	3rd	2nd
Teaching language				
Department				
Coordinator	Álvarez Bermúdez, Xana			
Lecturers	Álvarez Bermúdez, Xana			
E-mail	xana.alvarez.bermudez@gmail.com			
Web	<a href="http://www.forestaes.uvigo.es/">http://www.forestaes.uvigo.es/</a>			
General description	Description of the elements that influence in the hydrological cycle. Characterisation of hydrographic basins and quantification of the erosion. Technicians of control and management of the hydrographic basins			

**Competencies**

Code	
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 .
CE9	Ability to know, understand and use the principles of: forestry hydraulics; hydrology and hydrological-forest restoration.
CT4	Sustainability and environmental commitment

**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.	CG3	CE9	CT4
3R. 2018 Be conscious of the multidisciplinary context of the engineering.			
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.			
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.			
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
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Subject1 Introduction and generalities	Hydrological cycle. The hydrological basin. Physical parameters of the basin. Soil and climate. Actions of the forest on the water regulation. Hydrological subsystems. Hydrological models. legal framework .
Subject 2 Precipitation	Training and types. Measured atmospheric humidity. Terminal Speed drops rain. Size drops and kinetical energy. Measure and distribution of the precipitation. Methods of work with rainfall data. Half precipitation on an area
Subject 3 Evaporation	Solar radiation Profiles of wind in vegetation Evaporation and evapotranspiration Empirical methods Interception and transpiration in forests
Subject 4 Infiltration	Measure of humidity and potential water in the floor influential Factors instantaneous and accumulated Infiltration Flow in saturated means. Law of Darcy Models of infiltration Measured of the hydraulic conductivity
Subject 5 Runoff	Generation and classification of the flow of runoff Coefficient of runoff. Number Of Curve Methods of Green-Ampt Methods of estimate of runoff monthly Water balance and Thornthwaite
Subject 6 Hydrographs	Separation of basic flow Unitary and synthetic hydrographs Maximum Discharge of runoff
Subject 7 Surface water and groundwater	Aquifers hydrogeological variables Equations of subterranean flow
Subject 8 hydrological Measurements	Discharge Measurements of speed of flow Measurements with sensors of pressure Types of control of relation level and discharge
Subject 9 Driving of avenues of water	Introduction Traffic of aggregated systems hydrological Traffic in rivers Traffic distributed of increasing cinematic Wave
Subject 10 hydrological Statistics	Concepts. Analysis of frequency. Work of distribution. Period of return. Theory of adjust statistical. Analysis of frequency for extreme values .
Subject 11 hydrological Restoration forest	Action of the forest on water regulation. Distribution of the the precipitation in forest masses. Intercept. Translocation. Trunk runoff Hydrological techniques reforestation
Subject 12: Water erosion	Types of erosion. Parametric models Models of analytical solution . Stabilization and rehabilitation techniquesn of areas with risk of erosion
Subject 13: Restoration of banks and rivers	Main pressures and impacts of the Spanish rivers Environmental Assessment of the rivers Features and banks Performances for the improvement and restoration of rivers Development projects Ecological restoration of rivers and banks

Subject 14: transversal Works in the course	Dams of consolidation Dams of retention Planning and technical criteria of execution Act longitudinal in margins rivers Design of breakwaters Pavers background Deflectors
Subject 15: practical sessions	Hydrological modeling with HEC-HMS.  Configuration of projects in HEC-HMS and its capabilities for basin modeling through the introduction of the different components of the basin, as well as the meteorological model and control specifications.  Direct runoff hydrograph calculation produced by a precipitation event and analysis of results.

### Planning

	Class hours	Hours outside the classroom	Total hours
Practices through ICT	10	10	20
Autonomous problem solving	30	30	60
Studies excursion	3	3	6
Lecturing	30	30	60
Problem and/or exercise solving	3	0	3
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
Practices through ICT	I handle of software draw computer-aided for treatment of watershed. By means of this methodology develop the competitions A19 and A62
Autonomous problem solving	They will explain and/or they will resolve problems in group from a series of billed facilitated by the professor. The students will have to resolve a small number of exercises for each one of the subjects, that will have to deliver in the term indicated for his qualification. By means of this methodology develop the competitions A19 and A62
Studies excursion	It will realise visit to a place of interest hydrological to observe the hydrological conditions of the same and infrastructures and techniques of restoration employed. By means of this methodology develop the competitions A19 and A62
Lecturing	Classes in the classroom to the groups, where explain the corresponding contents to each subject. By means of this methodology develop the competitions A19 and A62

### Personalized assistance

Methodologies	Description
Autonomous problem solving	Some exercises will be solved in class and others the student will have to solve them independently

### Assessment

	Description	Qualification	Evaluated Competences
Problem and/or exercise solving	Practical supposition for his resolution. By means of this methodology evaluate the competitions A19 and A62	30	CE9
Problem and/or exercise solving	Proof with questions type test and of short answer, where the student will have to show the knowledge purchased. By means of this methodology evaluate the competitions A19 and A62	70	CE9

### Other comments on the Evaluation

### Sources of information

#### Basic Bibliography

#### Complementary Bibliography

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## Recommendations

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### Contingency plan

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#### Description

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=== EXCEPTIONAL MEASURES SCHEDULED ===

In front of the uncertain and unpredictable evolution of the sanitary alert caused by the \*COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide \*antelación) by the students and the \*profesorado through the tool normalised and institutionalised of the educational guides.

=== ADAPTATION OF THE METHODOLOGIES ===

\* educational Methodologies that keep : all

\* educational Methodologies that modify : it will change from the face-to-face modality to the on-line modality through the virtual campus of the university of Vigo.

\* Mechanism no face-to-face of attention to the students (\*tutorías): through the email and of the virtual dispatch of the professor

\* Modifications (if they proceed) of the contents to give: without modification

\* additional Bibliography to facilitate the car-learning: without modification

\* Other modifications

=== ADAPTATION OF THE EVALUATION ===

\* Test already made: they keep

Proof XX: [previous Weight 00%] [Weight Proposed 00%]

...

\* Pending proofs that keep : they keep

Proof XX: [previous Weight 00%] [Weight Proposed 00%]

...

\* Proofs that modify : without modification. They will become on-line examinations if the circumstances do not allow face-to-face examinations

[previous Proof] > [new Proof]

\* New test

\* additional Information

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**IDENTIFYING DATA****Forest management**

Subject	Forest management			
Code	P03G370V01605			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	3rd	2nd
Teaching language	Spanish Galician			
Department				
Coordinator				
Lecturers				
E-mail				
Web				
General description	During it study of #Ordination of Hills will #analyze the different methods stop the organisation and management of the *aproveitamento of the forest natural resources. The education will base in the *repaso of the European forest history and of the parallel evolution of the methods of #ordination. The presentation of problems will allow to enter the distinct solutions and the learning of the same by part of the student.			

**Competencies**

Code	
CG6	Ability to measure, inventory and evaluate forest resources, apply and develop silvicultural techniques and management of all types of forest systems, parks and recreational areas, as well as techniques for harvesting timber and non-timber forest products
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.
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.
CE24	Ability to know, understand and use the principles of: dasometry and forest inventory, forest management.
CE25	Ability to know, understand and use the principles of: forest legislation and certification; sociology and forestry policy.
CT4	Sustainability and environmental commitment
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.	CG6 CG10 CG13	CE24 CE25	CT4 CT6 CT8
3R. 2018 Be conscious of the multidisciplinary context of the engineering.			
4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.			
5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.			
6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.			
7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.			
8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.			
9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.			
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.			
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	
Introduction to the #Ordination of Hills	Definitions and concept Conditions and objective minima historical Evolution of the hills and of the Objective #ordination of the Forest Management
Strategic and legislative frame of the *planificación forest	Planning: international agreements, state and autonomic plans Legislation basic and complementary. Decrees Instructions of #ordination
Content of the instruments of #ordination	Classical structure of a *P.The Typology of instruments minimum Contents
Bases *selvicolas of the #ordination of hills	Relation with the minimum objectives Studio *estático of the hills dynamic Studio of the hills global Structures and conceptual base
Economic bases of the #ordination of hills	Criteria stop the determination of the turn, age of maturity or diameter of *cortabilidade technical Criteria, physical or financial
Methods of #Ordination	Introduction to the practical methods Division by fit Methods of stretches irregular Masses Management by *rodais
Certification of the forest management	Process, diagrams and modalities

## Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	26	52	78
Problem solving	4	10	14
Case studies	6	12	18
Scientific events	4	6	10
Studies excursion	10	18	28
Problem and/or exercise solving	1	0	1
Report of practices, practicum and external practices 1		0	1

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

### Methodologies

Methodologies	Description
Lecturing	Exhibition by part of the professor of the contained envelope to subject object of study, theoretical bases and/or guidelines of one work, exercise or project to develop pole student.
Problem solving	Activity in the that formulate problems and/or exercises related with the subject. The student owes to develop the suitable or correct solutions by means of it *ejercitación of routines, the application of formulas or algorithms, the application of procedures of transformation of the available information and the interpretation of the resulted. It usually employ how supplement of the lesson *maxistral.
Case studies	Analysis of a done, problem or real event with the aim to know it, interpreted, resolved, generate hypothesis, contrast data, *reflexionar, complete knowledges, diagnosed and trained in alternative procedures of solution.
Scientific events	Conferences, talks, exhibitions, round tables, debates... Realized by settings of prestige, that allow *afondar or supplement the contents of the subject.
Studies excursion	Activities of application of the knowledges to concrete situations and of acquisition of basic skills and *procedimentais related with the subject object of study. They develop in spaces no academic outsides. It go in they can be quoted practices of field, visits to events, centres of investigation, companies, institutions... Of academic interest-professional stop the student.

### Personalized assistance

Methodologies	Description
Problem solving	
Studies excursion	

### Assessment

	Description	Qualification	Evaluated Competences
Problem and/or exercise solving	Evaluation by means of proof of theoretical concepts	60	CG6
Report of practices, practicum and external practices	Continuous evaluation of the individual work. Resolution put student of practical cases and manufacture of report on case of study	40	CG6

### Other comments on the Evaluation

#### Sources of information

##### Basic Bibliography

MADRIGAL, A, **Ordenación de Montes Arbolados**, ICONA,

##### Complementary Bibliography

GONZALEZ MOLINA, et al., **Manual de Ordenación por Rodales**, Centre Tecnologic Forestal de Catalunya,

DAVIS, L. S.; JOHNSON, K. N.; BETTINGER, P. S.; HOWARD, T. E, **Forest Management (4th ed.)**, McGraw Hill Publishing Co.,

MADRIGAL, A.; ÁLVAREZ, J.G.; RODRÍGUEZ, R.; ROJO, A., **Tablas de producción para los montes españoles**, Fundación Conde del Valle de Salazar,

DÍAZ-MAROTO, I., **Evolución de los métodos de ordenación de montes en España. Situación actual.**, Escuela Politécnica Superior, Lugo,

ACEMM, **Manual de prevención de riesgos laborales en el sector forestal**, Fundación para la prevención de riesgos laborales. Gobierno de Cantabria,

DIEGUEZ, U. et al., **Herramientas Selvícolas para la Gestión Forestal Sostenible en Galicia**, Xunta de Galicia,

MARTÍNEZ CHAMORRO, et al., **Manual para a cubicación, taxación e venda de madeira en pe e biomasa forestal**, Universidade de Vigo,

**Manual de ordenación de montes de Andalucía**, Junta de Andalucía,



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## Recommendations

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### Subjects that continue the syllabus

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Physical planning and land management/P03G370V01701

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### Subjects that are recommended to be taken simultaneously

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Projects/P03G370V01503

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

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Mathematics: Statistics/P03G370V01301

Forestry/P03G370V01401

Use of forests/P03G370V01601

Dasometry/P03G370V01602

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## Contingency plan

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### Description

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=== EXCEPTIONAL MEASURES SCHEDULED ===

In front of it uncertain and unpredictable evolution of the sanitary alert caused by the COVID- 19, the University establishes join extraordinary planning that will actuate in the moment in that the administrations and the @propio institution determine it attending to criteria of security, health and responsibility, and guaranteeing the \*docencia in a @escenario no \*presencial or no totally \*presencial. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the \*docencia of a way but \*áxil and effective when being known beforehand (or with a wide advance) pole students and the teaching staff through the tool normalized and institutionalized of the teaching guides DOCNE\*T.

=== ADAPTATION OF The METHODOLOGIES ===

\* teaching Methodologies that keep : all except visit of studies

\* teaching Methodologies that modify : the visit of studies would be deleted and \*substituida by a case of study

\* Mechanism no \*presencial of attention to the students (\*titorías): \*email, remote campus and \*faitic

\* Modifications ( proceed) of the contained to impart

\* additional Bibliography to facilitate to car-learning

\* Other modifications

=== ADAPTATION OF The EVALUATION ===

\* Proofs already realized

Test XX: [previous Weight 00%] [Weight Proposed 00%]

...

\* Pending proofs that keep

Exercise final evaluation: [previous Weight 60%] [Weight Proposed 40%]

Works of continuous evaluation: [previous Weight 40%] [Weight Proposed 60%]

\* Proofs that modify

[previous Proof] => [new Proof]

\* New proofs

\* additional Information

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**IDENTIFYING DATA****Wood technology**

Subject	Wood technology			
Code	P03G370V01606			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	3rd	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	González Prieto, Óscar			
Lecturers	González Prieto, Óscar			
E-mail	oscargprieto@uvigo.es			
Web	<a href="http://www.forestales.uvigo.es">http://www.forestales.uvigo.es</a>			
General description	*Asignatura In which it studies the wood like industrial prime matter, his characteristics and properties			

**Competencies**

Code	
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.
CE28	Ability to know, understand and use the principles of: internal anatomical structure and macroscopic properties of wood.
CT4	Sustainability and environmental commitment

**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 CE28 CT4
3R. 2018 Be conscious of the multidisciplinary context of the engineering.	
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.	
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	

**Contents**

Topic	
Macroscopic structure of the wood	Albura, heartwood, marrow longitudinal and radial Fabrics Growth in rings Anisotropy of the wood Texture, grain and design
Microscopic structure of the wood	Microscopic structure of the wood of coniferous microscopic Structure of the wood of leafy
Structure submicroscopic	Submicroscopic structure Chemical composition of the wood

Anomalies and defects of the wood	Knots juvenile Wood Anomalies of the growth of the layer cambial Fends Wood of reaction internal Tensions of growth Stock exchanges of resin Other defects of the wood
Properties of the wood	Physical properties of the wood mechanical Properties of the wood
Industrial classification of the wood in roll	Classification in function of the characteristics of the wood and his aptitude for the different industrial applications

### Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	30	66	96
Laboratory practical	10	20	30
Studies excursion	7	8	15
Introductory activities	1	0	1
Problem and/or exercise solving	4	0	4
Report of practices, practicum and external practices	0	4	4

\*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 competitions of the subject
Laboratory practical	Delivery by heart individual or in group of practices made. In case of teaching no face-to-face or *semi-face-to-face, memory of audiovisual material worked.
Studies excursion	Explanation in situ of industrial and technical processes of laboratory. Presentation of a memory of the visits made. In the case of teaching no face-to-face or *semi-face-to-face, will evaluate memory elaborated employing audiovisual material of processes of manufacture of industries of the wood (videos and digital information).
Introductory activities	Initial explanation of the aims and development of the subject

### Personalized assistance

Methodologies	Description
Laboratory practical	The *tutorías will make preferably by telematic means (email, remotecampus, forums of doubts in *FaiTIC). For that student or student that request it will be able to make , inthe measure of the possible, *presencialmente. They will indicate to beginning of course the concrete forms ofcommunication as well as the schedules.

### Assessment

	Description	Qualification	Evaluated Competences
Lecturing	Continuous evaluation through the assistance to the classes of classroom. In case of teaching no face-to-face or *semi-face-to-face, will value the active participation in the debate that pose in the classroom/remote campus on the theoretical concepts. Also it will value the participation in the forums that enable in the platform *FaiTIC	20	
Laboratory practical	Continuous evaluation through the assistance to the practices of laboratory. In case of teaching no face-to-face or *semi-face-to-face, will value the active participation in the debate that pose in the classroom/remote campus on the theoretical concepts. Also it will value the participation in the forums that enable in the platform *FaiTIC .	5	
Problem and/or exercise solving	Realisation of partial proofs and finals. Proofs written on the theoretical and practical contents of the subject. Some proofs will be scheduled along the course and will be delivered through the platform of *Teledocencia.	70	

Report of practices, practicum and external practices      Realisation and presentation of the memories of the practices of laboratory. In the case of teaching no face-to-face or \*semi-face-to-face, will value memories of audiovisual material with which work .      5

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### Other comments on the Evaluation

Calendar of examinations:

according to official information of the School.&\*nbsp;<http://forestaes.uvigo.es/gl/docencia/exames/>

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### Sources of information

#### Basic Bibliography

#### Complementary Bibliography

Santiago Vignote Peña, **TECNOLOGIA DE LA MADERA (3ª ED.)**, Muni Prensa,

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### Recommendations

#### Subjects that continue the syllabus

Primary wood processing industries/P03G370V01706

Wood preservation and drying technology/P03G370V01705

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

Physics: Physics I/P03G370V01102

Physics: Physics II/P03G370V01202

Botany/P03G370V01303

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### Other comments

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

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### Contingency plan

#### Description

=== EXCEPTIONAL MEASURES SCHEDULED ===

In front of the uncertain and unpredictable evolution of the sanitary alert caused by the \*COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide \*antelación) by the students and the \*profesorado through the tool normalised and institutionalised of the educational guides.

\* Educational methodologies that keep introductory Activities

Lesson \*magistral

Resolution of problems

Work \*tutelado

\* educational Methodologies that modify

The exit of practices scheduled will not make in the case of teaching no face-to-face or in the case that it do not allow with teaching \*semi-face-to-face. \*substituirá By practical observation of audiovisual material of processes of manufacture of industries of the wood (videos and digital information)

\* Mechanism no face-to-face of attention to the students (\*tutorías)

virtual Dispatch, email and habilitation of forums in the platform \*FaiTIC

\* Modifications (if they proceed) of the contents to give

The exit of practices scheduled will not make in the case of teaching no face-to-face or in the case that it do not allow with teaching \*semi-face-to-face. \*substituirá By practical observation of audiovisual material of processes of manufacture of industries of the wood (videos and digital information)

\* additional Bibliography to facilitate the car-learning

is not necessary, since they facilitate it to him materials in the platform of \*teledocencia, many of them of own preparation by part of the professors, to be able to make a follow-up of the matter

\* Other modifications

is not necessary

=== ADAPTATION OF THE EVALUATION ===

\* Test already made

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keeps the weight when being adapted all the proofs to any circumstance  
\* Test slopes that keep  
keeps the weight when being adapted all the proofs to any circumstance  
\* Test that they modify  
is not necessary  
\* New proofs  
is not necessary  
\* additional Information  
does not require

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**IDENTIFYING DATA****Xylo energy**

Subject	Xylo energy			
Code	P03G370V01607			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	3rd	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	Ortiz Torres, Luis			
Lecturers	Ortiz Torres, Luis			
E-mail	lortiz@uvigo.es			
Web	<a href="http://www.webs.uvigo.es/lortiz">http://www.webs.uvigo.es/lortiz</a>			
General description	(*)procesos de transformación física y conversión energética de biomasa			

**Competencies**

## Code

- 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.
- CG6 Ability to measure, inventory and evaluate forest resources, apply and develop silvicultural techniques and management of all types of forest systems, parks and recreational areas, as well as techniques for harvesting timber and non-timber forest products
- 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.
- CE26 Ability to know, understand and use the principles of: xiloenergetic industrial processes
- CT2 Ability to communicate orally and written in Spanish or in English
- CT9 Teamwork skills, skills in interpersonal relationships and leadership.
- CT10 Autonomous Learning

**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.	CG1 CG6 CG11	CE26	CT2 CT9 CT10
3R. 2018 Be conscious of the multidisciplinary context of the engineering.			
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.			
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			
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.			
22R. 2018 Capacity to be to the day of the scientific and technological news.			

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## Contents

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### Topic

Topic 1.- INTRODUCTION: BIOMASS AS A SOURCE OF ENERGY	1.1.- Concept and forms of BIOMASS 1.2.- Historical evolution of the energy utilization of Biomass .. 1.3.- Sources of Biomass 1.4.- Characteristics of the biomass from the energetic point of view 1.5.- Advantages presented by the energy use of the Phytomass 1.6.- Technologies for energy conversion of biomass 1.6.1.- Chemical methods of conversion 1.6.2.- Thermochemical conversion methods 1.6.3.- Biochemical conversion methods 1.6.4.- Efficiency of the different methods of energy conversion. 1.7.- Products derived from biomass 1.7.1.- Macroeconomic aspects of the production and use of biofuels
2.- XILOGENERATED ENERGIES	2.- XILOGENERATED ENERGIES
3. COLLECTION AND OBTAINMENT OF RESIDUAL BIOMASS	3.1 systems for collecting residual forest biomass 3.1.1 Forest machines
4. PRETRATING PROCESSES (PHYSICAL TRANSFORMATION) OF RESIDUAL PHYTOMASE	4.1 Chipping and packaging 4.1.1 Problems of large chipping 4.2 Natural Drying 4.3 Forced drying grind 4.4 4.4.- Sieving 4.5.- densification
Topic 5. DEHYDRATION OF RESIDUAL PHYTOMASE	5.1 Water in wood 5.1.1 Humidity Equilibrium 5.1.2 Influence of moisture content on calorific 5.2 thermogenesis 5.2.1 dynamic drying full of wood waste chips 5.2.2 Dry matter losses 5.3 Practical experiences of natural drying 5.3.1 Forced ventilation 5.3.2 Experiences in Spain

Topic 6. COMPACTION OF RESIDUAL PHYTOMASE	6.1 Historical evolution 6.2 Background to research and development 6.2.1 laboratory experimentation 6.2.2 Experimentation in industrial presses 6.2.3 Studies of theoretical models 6.3 Prospects for the future 6.4 Problems and densification technologies on an industrial scale 6.4.1 manufacture of briquettes 6.4.2 pelletizing
Topic 7. CURRENT SITUATION OF THE FUEL PRODUCTION SECTOR IN SPAIN	7.1 The raw materials used 7.2 The equipment used 7.2.1 Sizing companies 7.3 Products obtained 7.3.1 Packaging 7.4.- Consumer sectors 7.4.1.- prices
Topic 8. CURRENT SITUATION OF THE COMBUSTIBLE PELLET MANUFACTURING SECTOR IN SPAIN	8.1 Characteristics of fuel pellets 8.2 prices
Topic 9.- THERMOCHEMICAL PROCESSES OF ENERGY CONVERSION OF PHYTOMASE.	9.1.- Combustion 9.2.- Gasification 9.3.- Pyrolysis 9.4.- Liquefaction
Topic 10. THE COMBUSTION	10.1 The Theory of Combustion 10.1.1.- types of combustion 10.1.2.- minimum combustion air 10.1.3.- Combustion fumes 10.2.- Combustion equipment 10.2.1.- Fluidized combustion (FBC)
Topic 11.GASIFICATION	11.1.- Types of gasifiers 11.2.- Gasification with air 11.3.- Gasification with oxygen and / or steam 11.4.- Gasification with Hydrogen 11.5.- Gasification with catalysts
Topic 12. PIROLISIS	12.1.- Products obtained 12.2.- Carbonization (charcoal)
Topic 13.- ELECTRICAL ENERGY GENERATION EQUIPMENT AND SYSTEMS	
Topic 14.- ENERGY CROPS OF SHORT ROTATION	14.1.- Prospects of intensive cultivation of biomass in the European Union before the new Community Agricultural Policy (CAP) 14.2.- Types of energy crops 14.2.1.- Agroelectrical crops 14.2.2.- Bioalcohol 14.2.3.- Bio-fuels
PRACTICE Nº 1	SAMPLES OF WASTE LABORATORY ANALYSIS PLACE: E. XILOGENERADAS LABORATORY
PRACTICE Nº2	PILOT PLANT FOR SLIPPING-MILLING-DENSIFICATION PLACE: E. XILOGENERADAS WORKSHOP
PRACTICE Nº 3	ASTILLADO DESCORTEZADO COMBUSTION COGENERATION  PLACE: ENCE (PONTEVEDRA) DEPARTURE FROM THE EIF - 10h
PRACTICE Nº 4	MOLIENDA DRYING PELETIZED COGENERATION  PLACE: PÉLET FACTORY (BASTAVALES) EIF OUTPUT - 10 h
PRACTICE Nº 5	Visit to an installation with forest biomass boiler.  Location: Campus de Pontevedra
PRACTICES Nº 6-7	Resolution of energy calculation exercises



<b>Planning</b>			
	Class hours	Hours outside the classroom	Total hours
Practicum, External practices and clinical practices	18	35	53
Laboratory practical	8	10	18
Lecturing	26	52	78
Essay questions exam	1	0	1

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

<b>Methodologies</b>	
	Description
Practicum, External practices and clinical practices	These are visits to industrial installations
Laboratory practical	These are lab work and pilot plant of xylenogenic energies
Lecturing	These are classroom classes

<b>Personalized assistance</b>	
Methodologies	Description
Lecturing	It refers to the theory classes held in the classroom
Practicum, External practices and clinical practices	These are visits to industrial facilities
Laboratory practical	Laboratory work and pilot plant of xylogen energies

<b>Assessment</b>			
	Description	Qualification	Evaluated Competences
Practicum, External practices and clinical practices	(*)Valorase a asistencia ás clases presenciais e visitas/prácticas de campo	20	CE26
Laboratory practical	(*)Valoranse os traballos/exercicios realizados durante as mesmas.	20	CE26
Essay questions exam	(*)Avaliarase mediante un exame final	60	CE26

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

the student must approve a practical part and a theoretical part separately. Exam dates 28 DE MAIO 10h 10 DE XULIO 12h

### **Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

### **Recommendations**

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

### **Contingency plan**

#### **Description**

=== EXCEPTIONAL PLANNING ===

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

=== ADAPTATION OF THE METHODOLOGIES ===

\* Teaching methodologies maintained

- \* Teaching methodologies modified
- \* Non-attendance mechanisms for student attention (tutoring)
- \* Modifications (if applicable) of the contents
- \* Additional bibliography to facilitate self-learning
- \* Other modifications

=== ADAPTATION OF THE TESTS ===

- \* Tests already carried out

Test XX: [Previous Weight 00%] [Proposed Weight 00%]

...

- \* Pending tests that are maintained

Test XX: [Previous Weight 00%] [Proposed Weight 00%]

...

- \* Tests that are modified

[Previous test] => [New test]

- \* New tests

- \* Additional Information
-

**IDENTIFYING DATA****Xestión ambiental**

Subject Xestión ambiental

Code P03G370V01608

Study programme Grao en Enxeñaría Forestal

Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	3	2c

Teaching language

Department

Coordinator

Lecturers

E-mail

Web

General description

**Competencias**

Code

**Resultados de aprendizaxe**

Learning outcomes

Competences

**Contidos**

Topic

**Planificación**

Class hours

Hours outside the classroom

Total hours

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

**Metodoloxía docente**

Description

**Atención personalizada****Avaliación**

Description

Qualification

Evaluated Competences

**Other comments on the Evaluation****Bibliografía. Fontes de información****Basic Bibliography****Complementary Bibliography****Recomendacións****Plan de Continxencias**

**IDENTIFYING DATA****Environmental Engineering**

Subject	Environmental Engineering			
Code	P03G370V01609			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	3rd	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	Ortiz Torres, Luis			
Lecturers	Ortiz Torres, Luis			
E-mail	lortiz@uvigo.es			
Web	<a href="http://www.webs.uvigo.es/lortiz">http://www.webs.uvigo.es/lortiz</a>			
General description	(*)metodos e sistemas de xestión medioambiental			

**Competencies**

Code	
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**Learning outcomes**

Learning outcomes	Competences
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**Contents**

Topic	
A. ATMOSPHERIC POLLUTION	A.1. ENVIRONMENTAL POLLUTANTS A.2. EFFECTS OF ATMOSPHERIC POLLUTION A.3. DESTRUCTION OF THE OZONE LAYER A.4. GLOBAL QUALITY A.4.1. Greenhouse gases A.4.2. The Kyoto Protocol TO 5. ACID RAIN A.6. OTHER CONTAMINANTS A.7. RIGHTS CORRUPTION OF POLLUTION A.8. ALTERNATIVE SOURCES OF ENERGY TO REDUCE ATMOSPHERIC EMISSIONS A.9. THE COGENERATION OF HEAT AND ELECTRICITY
B. RESIDUAL WATERS B.1. WATER	B.2. MANAGEMENT SYSTEMS: B.3. PHYSICO-CHEMICAL WATER PARAMETERS B.4. RESIDUAL WATER CONTAMINANTS B.5. RESIDUAL WATER PURIFICATION SYSTEMS B.5.2. Primary treatment B.5.2.1. Physical and Chemical Treatments B.5.3. Secondary treatment B.5.3.1. Biological Treatments B.5.4. Tertiary treatment B.5.5. Miscellaneous Treatments B.6. THE ANAEROBIA DIGESTION PROCESS B.7. FLOOR TREATMENT B.8. CASE STUDY
C. URBAN SOLID WASTE	C.1. LOS R.S.U. C.2. TREATMENT SYSTEMS C.2.2. CONTROLLED SHIFT C.2.2.1. Landfill with controlled use C.2.3. COMPOUND C.2.4. INCINERATION C.2.5. PYROLYSIS C.2.6. COMPARISON BETWEEN MANAGEMENT SYSTEMS

D. COMPOSITION	D.1. THE COMPOUND PROCESS D.1.1. PHYSICAL PARAMETERS D.1.2. COMPOUND SYSTEMS D.1.2.1. Indoor composting systems D.1.3. DEPURATION OF COMPOST D.1.4. COMPOST CHARACTERISTICS D.1.5. USING THE COPOST D.2. CROPS OF INTENSIVE TYPE
E. THE ANAEROBIA DIGESTION	E.1. THE ANAEROBIA DIGESTION E.2. PARAMETERS OF OPERATION AND CONTROL OF THE ANAEROBIC PROCESSES E.3. ANAEROBIA DIGESTION TECHNOLOGY E.3.1. Discontinuous digesters E.3.2. Continuous digesters E.3.2.1. Digesters with suspended biomass E.3.3. Two Phase Digester E.4. CONTROLLED VERTEDERO E.5. ANAEROBIA DIGESTION FACILITIES E.5.1. DESCRIPTION OF AN ANAEROBIA DIGESTION PLANT E.6. EXAMPLE OF INDUSTRIAL FACILITIES
F. THE RECYCLING	F.1. INTRODUCTION F.2. RECYCLED THEORY F.3. RECYCLING SYSTEMS F.4. PROBLEM OF THE RECYCLING PROCESS F.5. ADVANTAGES CONCERNING RECYCLING F.6. RECYCLING OF PAPER AND CARDBOARD F.6.1. PRODUCTION OF PASTE AND PAPER F.6.2. RECYCLING PAPER F.6.2.1. PREPARATION OF PAPER PASTE FROM PAPELOTE F.6.2.2.- DISFRANDED F.6.2.3.-DEPURATION F.6.3.4. UNLOCKED F.6.3.5. REFINE F.6.3.6. DIVISION F.6.3.7. IT'S HEAVY F.6.3.8. DISPERSION F.6.3.9. DESTINED
G. TOXIC AND DANGEROUS WASTE	G.1. IDENTIFICATION AND QUANTIFICATION OF RTP. G.2. PRODUCTION MANAGER RELATIONSHIP G.1.1. Obligations of the RPT Producer G.1.1.1. Authorization request G.2.1.2. Packaging and Labeling of Hazardous Wastes G.2.1.3. Storage of hazardous waste G.2.1.4. Annual statement G.2.2. OBLIGATIONS OF SMALL PRODUCERS OF HAZARDOUS WASTE

### Planning

	Class hours	Hours outside the classroom	Total hours
Studies excursion	18	40	58
Case studies	7	5	12
Autonomous problem solving	9	20	29
Lecturing	17	33	50
Essay questions exam	1	0	1

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

### Methodologies

Description
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Studies excursion	Practices Practice 1.- Waste water treatment plant (EDAR - Pontevedra)
	Practice 2.- MSW treatment plant (SOGAMA - Cerceda)
	Practice 3.- Cogeneration and treatment of effluents (ENCE)
	Practice 4.- Cogeneration and waste management (ECOWARM- Bastabales)

The A91 competition will be developed in the field of industrial facilities visits.

Case studies	Individual or paired an individual chosen within the contents of the program for the elaboration of a situation or concrete case that will be presented publicly.
Autonomous problem solving	This is to present flow diagrams of the facilities visited during the course
Lecturing	These are theoretical classes in the classroom

### Personalized assistance

Methodologies	Description
Studies excursion	These are views of industrial facilities
Case studies	It is a practical work and present it publicly

### Assessment

	Description	Qualification	Evaluated Competences
Studies excursion	(*)Valórase a asistencia dos alumnos ás saídas prácticas	10	
Case studies	(*)O traballo é valorado e avaliado polos propios compañeiros tras a presentación do mesmo e polo profesor quen terá en consideración todos os factores sinalados no apartado de traballos tutelados	20	
Lecturing	(*)Valorarase a asistencia ás clases.	10	
Essay questions exam	(*)Avaliaranse os coñecementos adquiridos durante o desenvolvemento da materia.	60	

### Other comments on the Evaluation

### Sources of information

#### Basic Bibliography

Sánchez, Antoni, **De residuo a recurso**, 1, Mundi Prensa, 2014  
 Gil, Manuel, **Depuración de aguas residuales**, 1, CSIC, 2013  
 Seoanez, Mariano, **Manual de aguas residuales industriales**, 1, Mac Graw Hill, 2012  
 Picoraio, Simona, **Gestión de residuos Urbanos**, 1, CEYSA, 2016  
 Seoanez, Mariano, **Tratado de la contaminación atmosférica**, 1, Mundi Prensa, 2012

#### Complementary Bibliography

### Recommendations

### Other comments

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

### Contingency plan

#### Description

=== EXCEPTIONAL PLANNING ===

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

advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===

- \* Teaching methodologies maintained
  
- \* Teaching methodologies modified
  
- \* Non-attendance mechanisms for student attention (tutoring)
  
- \* Modifications (if applicable) of the contents
  
- \* Additional bibliography to facilitate self-learning
  
- \* Other modifications

=== ADAPTATION OF THE TESTS ===

- \* Tests already carried out  
Test XX: [Previous Weight 00%] [Proposed Weight 00%]  
...
  
  - \* Pending tests that are maintained  
Test XX: [Previous Weight 00%] [Proposed Weight 00%]  
...
  
  - \* Tests that are modified  
[Previous test] => [New test]
  
  - \* New tests
  
  - \* Additional Information
-