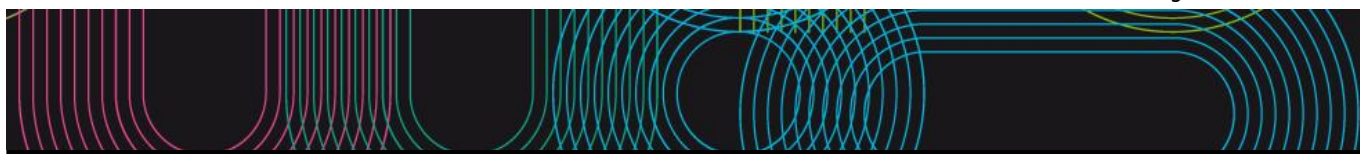




TABLA DE ERROS	
Lugar do erro	Descrición
Apartado de titulación 'Address'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 223]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=32&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Address'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 231]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=32&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Address'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 223]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=31&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Address'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 231]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=31&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Additional information'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 223]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=36&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Additional information'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 231]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=36&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Additional information'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 223]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=34&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Additional information'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 231]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=34&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Additional information'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 223]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=33&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found
Apartado de titulación 'Additional information'	Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20190611-122652/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 231]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=33&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found



(*)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.forestaes.uvigo.es>

Our faculty offers the Degree in Forest Engineering

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

Address

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



Faculty Management

Managerial team:

Director: D. Enrique Valero Gutiérrez del Olmo

Deputy director: D^a. Angeles Cancela Carral

Secretary: D. Juan Picos Martín

Governing bodies:

- Faculty Assembly

- Commissions:

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

Departments in the Centre:

(*)Servizo e Infraestructuras do Centro

(*)

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

Aulas e laboratorios:

Aulas docentes:

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

Laboratorios e talleres:

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

2º	Lab. Enxeñaría Eléctrica	110,73 m ²	21	NO	NO
2º	Lab. Enxeñaría Química	109,98 m ²	15	27,40 m ²	6

Additional information

STUDENTS OFFICE:

Number tfno.: 986 801913

And-mail: daeuetf@uvigo.es



Main Regulations

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

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

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

<http://extension.uvigo.es>

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

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

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

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

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

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

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

Other Information

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

(*) Grao en Enxeñaría Forestal

Subjects

Year 3rd

Code	Name	Quadmester	Total Cr.
P03G370V01501	Construcións forestais	1st	6
P03G370V01502	Maquinaria forestal	1st	6
P03G370V01503	Proxectos	1st	6
P03G370V01504	Impacto ambiental	1st	6
P03G370V01505	Lexislación e certificación forestal	1st	6
P03G370V01601	Aproveitamentos forestais	2nd	6
P03G370V01602	Dasometría	2nd	6
P03G370V01603	Repoboacións	2nd	6
P03G370V01604	Hidroloxía forestal	2nd	6
P03G370V01605	Ordenación de montes	2nd	6
P03G370V01606	Tecnoloxía da madeira	2nd	6
P03G370V01607	Xiloenerxética	2nd	6
P03G370V01608	Xestión ambiental	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				
Department				
Coordinator	Riveiro Rodríguez, Belén			
Lecturers	Riveiro Rodríguez, Belén			
E-mail	belenriveiro@uvigo.es			
Web	http://http://faitic.uvigo.es/index.php/es/			
General description	(*)Principios, Coñecementos e Normas nos que se fundamentan as Construcións Forestais e o deseño de Vías Forestais			

Competencies

Code	Typology
CG27 CG-27: Coñecementos das seguintes materias necesarios tanto para a xestión dos sistemas forestais como para a súa conservación: construción.	• know
CG29 CG-29: Coñecementos das seguintes materias necesarios tanto para a xestión dos sistemas forestais como para a súa conservación: camiños forestais.	• know
CE18 (*)CE-18: Capacidade para coñecer, comprender e utilizar os principios de: construcións forestais e vías forestais.	• know • Know How
CT1 (*)CBI 1: Capacidade de análise e síntese.	• know • Know How
CT2 (*)CBI 2: Capacidade de organización e planificación.	• Know How
CT3 (*)CBI 3: Capacidade de comunicación oral e escrita tanto na lingua vernácula como en linguas estranxeiras.	• know • Know How
CT4 (*)CBI 4: Coñecementos básicos de informática.	• know
CT5 (*)CBI 5: Capacidade de xestión da información.	• Know How
CT6 (*)CBI 6: Adquirir capacidade de resolución de problemas.	• Know How
CT7 (*)CBI 7: Adquirir capacidade na toma de decisións.	• Know How
CT8 (*)CBP 1: Capacidades de traballo en equipo, con carácter multidisciplinar e en contextos tanto nacionais como internacionais.	• Know be
CT9 (*)CBP 2: Habilidades nas relacións interpersoais.	• Know be
CT10 (*)CBP 3: Recoñecer a diversidade e a multiculturalidade.	• Know be
CT11 (*)CBP 4: Habilidades de razoamento crítico.	• Know How
CT12 (*)CBP 5: Desenvolver un compromiso ético, que implique o respecto dos dereitos fundamentais e de igualdade entre homes e mulleres, e dos principios de igualdade de oportunidades, accesibilidade universal a persoas con discapacidade e educación para a paz.	• Know be
CT13 (*)CBS 1: Aprendizaxe autónoma.	• Know How
CT14 (*)CBS 2: Adaptación a novas situacións.	• Know be
CT15 (*)CBS 3: Creatividade.	• Know be
CT16 (*)CBS 4: Liderado.	• Know be
CT17 (*)CBS 5: Coñecemento doutras culturas e costumes.	• know • Know be
CT18 (*)CBS 6: Iniciativa e espírito emprendedor.	• Know be
CT19 (*)CBS 7: Motivación pola calidade.	• Know be
CT20 (*)CBS 8: Sensibilidade cara a temas ambientais.	• Know be

Learning outcomes

Learning outcomes	Competences
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(*)CE-18: Capacidad para conocer, comprender y utilizar los principios en los que se fundamentan las Construcciones forestales y Vías forestales.

CG27
CG29
CE18
CT1
CT2
CT3
CT4
CT5
CT6
CT7
CT8
CT9
CT10
CT11
CT12
CT13
CT14
CT15
CT16
CT17
CT18
CT19
CT20

New

Contents

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
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
Master Session	21	42	63
Troubleshooting and / or exercises	11	22	33
Practice in computer rooms	9	27	36
Jobs and projects	1	8	9
Multiple choice tests	1	2	3
Long answer tests and development	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.
Master Session	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.
Troubleshooting and / or exercises	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.
Practice in computer rooms	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 attention

Methodologies	Description
Troubleshooting and / or exercises	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.

Tests	Description
Jobs and projects	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.

Assessment

	Description	Qualification	Evaluated Competences
Jobs and projects	(*)Ao longo do curso realizaranse traballos ou pequenos proxectos nos que se abordarán exercicios e casos de estudo que complementen as sesións prácticas.	15	CE18
Multiple choice tests	(*)Realizaranse dúas probas ao longo do curso para fixar os coñecementos adquiridos	10	CE18
Long answer tests and development	(*)Examen evaluatorio final de verificación de adquisición das competencias específicas	75	CE18

Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

M. Vázquez, RESISTENCIA DE MATERIALES, 4, Noela

P. Jiménez Montoya, HORMIGÓN ARMADO, 1, Gustavo Gili

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

MINISTERIO DE FOMENTO, CODIGO TECNICO DE EDIFICACION, 1, B.O.E.

Ferdinand P. Beer, MECÁNICA DE MATERIALES, 1, Mc. Graw Hill

Recommendations

Subjects that continue the syllabus

Hydraulics/P03G370V01404

Forest exploitation/P03G370V01601

Environmental Impact/P03G370V01504

Forest Fires/P03G370V01802

Primary wood processing industries/P03G370V01706

Subjects that are recommended to be taken simultaneously

Forest certification and legislation/P03G370V01505

Forestry machinery/P03G370V01502

Projects/P03G370V01503

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

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				
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 woools machines *employed in woools 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 woools machines *and of *the teams associated the same *woools, *and in *general woools *industrial *applications in that they are used.			

Competencies		
Code		Typology
CG2	CG-02: Capacidade para comprender os seguintes fundamentos necesarios para o desenvolvemento da actividade profesional: Físicos.	• know • Know How
CG30	CG-30: Coñecementos das seguintes materias necesarios tanto para a xestión dos sistemas forestais como para a súa conservación: maquinaria e mecanización.	• know
CE20	(*)CE-20: Capacidade para coñecer, comprender e utilizar os principios de: maquinaria e mecanización forestais.	• know • Know How
CT1	(*)CBI 1: Capacidade de análise e síntese.	• know • Know How
CT5	(*)CBI 5: Capacidade de xestión da información.	• Know How
CT13	(*)CBS 1: Aprendizaxe autónoma.	• Know How

Learning outcomes	
Learning outcomes	Competences
	CG2 CG30 CE20 CT1 CT5 CT13

Lana relation between competitions *and results, *and he weight of each competition inside wool matter show * in him *pdf *attach.
http://forestales.uvigo.es/sites/default/files/19%20%20Machinery.*Pdf#***overlay-***context=are/**content/competitions-*and-resuled-of-*learning-by-matter

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 explotatrions.	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
Master Session	29	86	115
Presentations / exhibitions	2	10	12
Laboratory practises	14	6	20
Multiple choice tests	1	0	1
Troubleshooting and / or exercises	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
Master Session	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
Presentations / exhibitions	Realisation of works in groups on thematic specific and presentation of the same in the classroom
Laboratory practises	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 attention	
Methodologies	Description
Master Session	
Laboratory practises	
Presentations / exhibitions	

Assessment			
	Description	Qualification	Evaluated Competences
Master Session	Participation in the class. Proposal of **cuestions of theory justified on the content given.	0	CG2 CG30 CE20
Laboratory practises	Realisation of practices of laboratory and delivery of memories on the same.	20	CG2 CE20 CT1 CT5 CT13
Presentations / exhibitions	Realisation of works on the content of the **asignatura. Exhibition in the classroom.	20	CG2 CG30 CE20 CT1 CT5 CT13
Multiple choice tests	Resolution of questionnaire of theory type test.	25	CG2 CG30 CE20 CT1 CT5
Troubleshooting and / or exercises	Resolution of problems and/or exercises related with the *temario of the **asignatura.	35	CG2 CG30 CE20 CT1 CT5

Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

Moran J and Shapiro H, Fundamentos de Termodinámica Técnica, 2004, Ed. Reverté

Çengel Y. y Boles M., Termodinámica, 7ª edición (2011), McGraw-Hill

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

Agüera Soriano J., Termodinámica Lógica y Motores Térmicos, 1993, Ed. Ciencia 3

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

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

Recommendations

Subjects that continue the syllabus

Primary wood processing industries/P03G370V01706

Product development and innovation in the wood industry/P03G370V01708

Subjects that it is recommended to have taken before

Physics: Physics I/P03G370V01102

Physics: Physics II/P03G370V01202

Mathematics: Mathematics and IT/P03G370V01103

Hydraulics/P03G370V01404

IDENTIFYING DATA				
Projects				
Subject	Projects			
Code	P03G370V01503			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Mandatory	3rd	1st
Teaching language				
Department				
Coordinator	Valero Gutiérrez del Olmo, Enrique María			
Lecturers	Picos Martín, Juan Valero Gutiérrez del Olmo, Enrique María			
E-mail	evalero@uvigo.es			
Web	http://http://faitic.uvigo.es/index.php/es/			
General description	(*)Esta materia é de carácter eminentemente aplicado e co obxectivo de que os alumnos adquiran os coñecementos básicos mediante a aprendizaxe dos conceptos, terminoloxía, teoría, e metodoloxía necesarios para ser capaz de entender, formular e resolver un proxecto.			

Competencies	
Code	Typology
CG35 CG-35: Capacidade para deseñar, dirixir, elaborar, implantar e interpretar proxectos.	• know • Know How
CG36 CG-36: Capacidade para deseñar, dirixir, elaborar, implantar e interpretar plans.	• know • Know How
CG37 CG-37: Capacidade para redactar informes técnicos.	• Know How
CG38 CG-38: Capacidade para redactar memorias de recoñecemento.	• Know How
CG39 CG-39: Capacidade para redactar valoracións.	• Know How
CG40 CG-40: Capacidade para redactar peritaxes.	• Know How
CG41 CG-41: Capacidade para redactar taxacións.	• Know How
CG42 CG-42: Capacidade para entender, interpretar e adoptar os avances científicos no campo forestal, para desenvolver e transferir tecnoloxía e para traballar nun medio multilingüe e multidisciplinar.	• know • Know How
CT1 (*)CBI 1: Capacidade de análise e síntese.	• know • Know How
CT2 (*)CBI 2: Capacidade de organización e planificación.	• Know How
CT3 (*)CBI 3: Capacidade de comunicación oral e escrita tanto na lingua vernácula como en linguas estranxeiras.	• know • Know How
CT5 (*)CBI 5: Capacidade de xestión da información.	• Know How
CT6 (*)CBI 6: Adquirir capacidade de resolución de problemas.	• Know How
CT7 (*)CBI 7: Adquirir capacidade na toma de decisións.	• Know How
CT8 (*)CBP 1: Capacidades de traballo en equipo, con carácter multidisciplinar e en contextos tanto nacionais como internacionais.	• Know be
CT9 (*)CBP 2: Habilidades nas relacións interpersoais.	• Know be
CT11 (*)CBP 4: Habilidades de razoamento crítico.	• Know How
CT13 (*)CBS 1: Aprendizaxe autónoma.	• Know How
CT14 (*)CBS 2: Adaptación a novas situacións.	• Know be
CT15 (*)CBS 3: Creatividade.	• Know be
CT16 (*)CBS 4: Liderado.	• Know be
CT20 (*)CBS 8: Sensibilidade cara a temas ambientais.	• Know be

Learning outcomes	
Learning outcomes	Competences

(*)

CG35
CG36
CG37
CG38
CG39
CG40
CG41
CG42
CT1
CT2
CT3
CT5
CT6
CT7
CT8
CT9
CT11
CT13
CT14
CT15
CT16
CT20

New

Contents

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 -Posts of conditions -Budget
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	-The forest projects - Industrial projects of 1st transformation -Projects of management of forest masses -Projects of forest infrastructure in the forest - 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
Presentations / exhibitions	75	0	75
Projects	38	0	38
Forum Index	12	0	12
Proceedings	13	0	13
Laboratory practises	12	0	12
Multiple choice tests	2	0	2
Jobs and projects	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
Presentations / exhibitions	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.
Projects	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.
Forum Index	Activity within a virtual environment in which they discussed various topics related to the academic and / or professional.
Proceedings	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 ...
Laboratory practises	Activities application of knowledge to specific situations and basic skills acquisition and related procedural matter under study. Special spaces are developed with specialized equipment (scientific and technical laboratories, languages, etc.).

Personalized attention

Methodologies	Description
Presentations / exhibitions	
Laboratory practises	
Projects	
Forum Index	
Proceedings	

Assessment

	Description	Qualification	Evaluated Competences
Presentations / exhibitions	(*)Exames finais, ou por escrito de tipo redacción ou desenvolvemento dun ou varios temas, ou ben de tipo test, ou combinados ou ben, no seu caso exames orais.	40	CT1 CT3 CT11 CT13
Projects	(*)Realización dun anteproxecto técnico de carácter semi-profesional.	40	CG35 CG36 CG37 CG38 CG39 CG40 CG41 CG42 CT2 CT3 CT6 CT7 CT8 CT9 CT13 CT14 CT15 CT16 CT20
Multiple choice tests		0	

Jobs and projects	(*)Avaliación continua do alumno a través da súa asistencia e participación, tanto nas clases coma en debates e foros de discusión.	20	CT3 CT6 CT7 CT8 CT13 CT14 CT15
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Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

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- PEÑA, A., Apuntes de Proyectos: Proyectos de Ingeniería y Documento Proyecto., 1997, Departamento de Ingeniería Rural. ETSIAM, Córdoba.
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- PIQUER, J.S, El proyecto en ingeniería y arquitectura, 2003, Ed. CEAC, Barcelona
- ESCRIVA, I.V., J.L.. PEREZ-SALAS y V. SEGURA, Cuadro de precios. Ingeniería agronómica y alimentaria, 1996, Fundación para la promoción de la ingeniería agron
- SAPAG CHAIN, N, Fundamentos de Preparación y Evaluación de Proyectos, 2005, Ed. McGraw-Hill. Bogotá
- MORRILLA ABAD, IGNACIO, Guía metodológica y práctica para la realización de proyectos., 1998, Colegio de Ingenieros de Caminos, Canales y Puerto

Recommendations

Subjects that are recommended to be taken simultaneously

- Forest exploitation/P03G370V01601
- Forest constructions/P03G370V01501
- Environmental management/P03G370V01608
- 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

IDENTIFYING DATA**Environmental Impact**

Subject	Environmental Impact		
Code	P03G370V01504		
Study programme	(*)Grao en Enxeñaría Forestal		
Descriptors	ECTS Credits	Type	Year
	6	Mandatory	3rd
Teaching language			
Department			
Coordinator	Fernández Alonso, José María		
Lecturers	Fernández Alonso, José María		
E-mail	txema182@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		Typology
CB1	(*)Que os estudantes posúan e comprendan coñecementos que aporten unha base ou oportunidade de ser orixinal no desenvolvemento e / ou aplicación de ideas, a miúdo nun contexto de investigación	• know • Know How
CB2	Que los estudiantes sepan aplicar conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio	• know • Know How
CG6	CG-06: Capacidade para identificar os diferentes elementos: elementos bióticos.	• know • Know How
CG7	CG-07: Capacidade para identificar os diferentes elementos: elementos físicos.	• know • Know How
CG8	CG-08: Capacidade para identificar os diferentes elementos: recursos naturais renovables susceptibles de protección, conservación e aproveitamento.	• know • Know How
CG9	CG-09: Capacidade para analizar a estrutura e función ecolóxica dos sistemas e recursos forestais, incluíndo as paisaxes.	• know • Know How
CG13	CG-13: Coñecemento dos procesos de degradación que afecten aos sistemas e recursos forestais en xeral.	• know • Know How
CG14	CG-14: Capacidade para o uso das técnicas de protección do medio forestal.	• know • Know How
CG17	CG-17: Capacidade para avaliar e corrixir o impacto ambiental.	• know • Know How
CG18	CG-18: Capacidade para aplicar as técnicas de auditoría.	• know • Know How
CG19	CG-19: Capacidade para aplicar as técnicas de xestión ambiental.	• know • Know How
CE19	(*)CE-19: Capacidade para coñecer, comprender e utilizar os principios de: avaliación e corrección do impacto ambiental; recuperación de espazos degradados.	• know • Know How • Know be
CT1	(*)CBI 1: Capacidade de análise e síntese.	• know • Know How
CT2	(*)CBI 2: Capacidade de organización e planificación.	• know • Know How
CT11	(*)CBP 4: Habilidades de razoamento crítico.	• know • Know How
CT14	(*)CBS 2: Adaptación a novas situacións.	• know • Know How
CT15	(*)CBS 3: Creatividade.	• know • Know How
CT20	(*)CBS 8: Sensibilidade cara a temas ambientais.	• know • Know How

Learning outcomes

Learning outcomes	Competences
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(*)CE-19: Capacidad para conocer, comprender y utilizar los principios de: evaluación y corrección del impacto ambiental; recuperación de espacios degradados.	CB1 CB2 CG6
CE-19.1.- Aprender y conocer los conceptos básicos sobre el medio ambiente y la gestión del mismo.	CG7 CG8
CE-19.2.- Conocer el desarrollo de las políticas ambientales en el mundo y en el seno de la Unión Europea y el desarrollo de las actuaciones desde el sector público en materia de Medio Ambiente.	CG9 CG13 CG14
CE-19.3.- Conocer la legislación ambiental vigente a nivel global, nacional, regional.	CG17 CG18
CE-19.4.- Conocer los factores ambientales y las bases del Desarrollo Sostenible.	CG19 CE19
CE-19.5.- Conocer y aprender a utilizar los indicadores de impacto.	CT1 CT2
CE-19.6.- Conocer la tipología de los impactos ambientales y su clasificación y características.	CT11 CT14
CE-19.7.- Conocer el procedimiento administrativo de evaluación de impacto ambiental y los diferentes tipos de evaluación en diferentes etapas.	CT15 CT20
CE-19.8.- Conocer la importancia de los planes generales y globales y la implicación medioambiental de las políticas sectoriales.	
CE-19.9.- Conocer el proceso de evaluación ambiental estratégica.	
CE-19.10.- Conocer los apartados que debe contener un estudio de impacto ambiental y los pasos para realizarlo.	
CE-19.11.- Aprender a identificar las acciones de un proyecto o acción que pueden provocar impactos.	
CE-19.12.- Aprender a realizar el inventario ambiental y a identificar los factores susceptibles de sufrir impactos.	
CE-19.13.- Aprender a identificar los impactos ambientales de una acción, obra, proyecto, plan, etc.	
CE-19.14.- Conocer y aplicar los distintos métodos y sistemas de valoración de impactos: cualitativos y cuantitativos. Conocer en profundidad algunos de los más utilizados: Graficos, guías, etc. Aplicación de alguno de los más utilizados: matriz de Leopold, sistema de Battelle-Columbus, etc.	
CE-19.15.- Conocer las medidas correctoras y protectoras que se deben o pueden aplicar según la gravedad de los impactos.	
CE-19.16.- Conocer el contenido y funcionamiento de las planes de vigilancia ambiental y la metodología de elaboración.	
CE-19.17.- Conocer el objetivo y la metodología de realización de las auditorías medioambientales.	
CE-19.18.- Conocer y aprender las técnicas, tratamientos y obras de recuperación de espacios degradados de especiales características: vertederos, canteras, etc.	
CE-19.19.- Conocer y aprender técnicas de plantación y revegetación en espacios degradados de difícil recuperación: Hidrosiembra, etc.	

New

Contents

Topic	
Subject 1.	Concepts and concepts: Environment and environmental management.
Subject 2.	History and environmental regulations in Europe. Environmental action plans of the European Union.
Subject 3.	Environmental management in the public sector. Environmental Plans. Global plans. Sectoral plans.
Subject 4.	Environmental legislation: In the European Union, in Spain, in the Autonomous Communities.
Subject 5.	Environment and Natural environment. Environmental factors. Actions and activities that produce impacts.
Subject 6.	Sustainable development. Renewal rate, assimilation capacity and host capacity.
Subject 7.	Impact of a project or activity. Impact on the different phases of the project.

Subject 8.	Indicators of impact. Biological indicators.
Subject 9.	Typology of impacts. Cataloging and classification of environmental impacts.
Subject 10.	Types of environmental impact assessment.
Subject 11.	EIA process. Administrative process and content of the EIA. Declaration of Environmental Impact.
Subject 12.	Environmental impact studies: content and process.
Subject 13.	Studies of project actions that can cause impacts.
Subject 14.	Environmental inventory and factors susceptible of affection.
Subject 15.	Identification and assessment of impacts. Techniques and methods.
Subject 16.	Qualitative methods and quantitative methods.
Subject 17.	Corrective and protective measures. Environmental monitoring plans. Environmental control plans.
Subject 18.	Eco audits and environmental audits.
Subject 19.	Degraded areas: landfills, tailings, slopes, mines, etc. Recovery work.
Subject 20.	Civil works for the regeneration and environmental actions and of restoration and recovery.
Subject 21.	Revegetation and planting.
Subject 22.	Hidrosiembra

Planning

	Class hours	Hours outside the classroom	Total hours
Tutored works	37	0	37
Laboratory practises	20	0	20
Case studies / analysis of situations	30	0	30
Classroom work	60	0	60
Multiple choice tests	1	0	1
Jobs and projects	1	0	1
Reports / memories of practice	1	0	1

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

Methodologies

	Description
Tutored works	The student, individually or in groups, prepares a paper on the subject of matter or prepare seminars, research, memoirs, essays, summaries of readings, lectures, etc.. Generally it is an autonomous activity / of the student / s that includes finding and collecting information, reading and literature management, writing ...
Laboratory practises	Activities application of knowledge to specific situations and basic skills acquisition and related procedural matter under study. Special spaces are developed with specialized equipment (scientific and technical laboratories, languages, etc.).
Case studies / analysis of situations	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.
Classroom work	Students develop exercises or classroom projects under the guidance and supervision of the teacher. May link autonomous development of student activities.

Personalized attention

Methodologies	Description
Classroom work	
Tutored works	
Laboratory practises	
Case studies / analysis of situations	
Tests	Description
Multiple choice tests	
Jobs and projects	
Reports / memories of practice	

Assessment

Description	Qualification	Evaluated	Competences
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Classroom work	(*)Se valora la asistencia y participación con seguimiento individual de los alumnos Se evalúan las competencias básicas CB1 y CB2, las generales CG6, CG7, CG8, CG9, CG13, CG14, CG17, CG18 y CG19, la específica CE19 (CE 19.1 a 19.19) y las transversales CT1, CT2, CT11, CT14, CT15 y CT20	10	CB1 CB2 CG6 CG7 CG8 CG9 CG14 CG17 CG18 CG19 CE19 CT14 CT15 CT20
Tutored works	(*)Se valora por parte del profesor la dedicación del alumno, el interés y el desarrollo de los trabajos, su valoración se realiza en la evaluación final del estudio de casos presentado Se evalúan las competencias básicas CB1 y CB2, las generales CG6, CG7, CG8, CG9, CG13, CG14, CG17, CG18 y CG19, la específica CE19 (CE 19.1 a 19.19) y las transversales CT1, CT2, CT11, CT14, CT15 y CT20	0	
Laboratory practises	(*)Se valora la asistencia y participación de forma conjunta con los trabajos de aula Se evalúan las competencias básicas CB1 y CB2, las generales CG6, CG7, CG8, CG9, CG13, CG14, CG17, CG18 y CG19, la específica CE19 (CE 19.1 a 19.19) y las transversales CT1, CT2, CT11, CT14, CT15 y CT20	0	
Case studies / analysis of situations	(*)El trabajo es valorado y evaluado por los propios compañeros tras la presentación del mismo y por el profesor quien tendrá en consideración todos los factores señalados en el apartado de trabajos tutelados Se evalúan las competencias básicas CB1 y CB2, las generales CG6, CG7, CG8, CG9, CG13, CG14, CG17, CG18 y CG19, la específica CE19 (CE 19.1 a 19.19) y las transversales CT1, CT2, CT11, CT14, CT15 y CT20	20	CB1 CB2 CG8 CG9 CG13 CG14 CG17 CG18 CG19 CT1 CT2 CT11 CT14 CT15
Multiple choice tests	(*)Se realiza una prueba tipo test al final de la asignatura a modo de examen final sobre los contenidos del temario que se han desarrollado en el curso y sobre las materias de las visitas y prácticas Se evalúan las competencias básicas CB1 y CB2, las generales CG6, CG7, CG8, CG9, CG13, CG14, CG17, CG18 y CG19, la específica CE19 (CE 19.1 a 19.19) y las transversales CT1, CT2, CT11, CT14, CT15 y CT20	50	CB1 CB2 CG6 CG7 CG8 CG9 CG13 CG14 CE19

Jobs and projects	<p>(*)El trabajo presentado deberá tener una parte importante de contenido técnico y se valorará su innovación en cuanto a temática y desarrollo, Su evaluación será incluida en el estudio de casos. La valoración adicional será consecuencia de la obtención de los objetivos planteados inicialmente</p> <p>Se evalúan las competencias básicas CB1 y CB2, las generales CG6, CG7, CG8, CG9, CG13, CG14, CG17, CG18 y CG19, la específica CE19 (CE 19.1 a 19.19) y las transversales CT1, CT2, CT11, CT14, CT15 y CT20</p>	10	CB1 CB2 CG14 CG17 CG18 CG19 CE19 CT1 CT2 CT11 CT15 CT20
Reports / memories of practice	<p>(*)El alumno presentará un informe sobre las cuestiones que suscitaron debate en las prácticas con la solución aportada por ellos para cada uno de los casos</p> <p>Se evalúan las competencias básicas CB1 y CB2, las generales CG6, CG7, CG8, CG9, CG13, CG14, CG17, CG18 y CG19, la específica CE19 (CE 19.1 a 19.19) y las transversales CT1, CT2, CT11, CT14, CT15 y CT20</p>	10	CB1 CB2 CG14 CG17 CG18 CG19 CE19 CT1 CT2 CT11 CT15

Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

Recommendations

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				
Lecturers				
E-mail				
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		Typology
CB1	(*)Que os estudantes posúan e comprendan coñecementos que aporten unha base ou oportunidade de ser orixinal no desenvolvemento e / ou aplicación de ideas, a miúdo nun contexto de investigación	<ul style="list-style-type: none"> • know • Know How • Know be
CB2	Que los estudiantes sepan aplicar conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio	<ul style="list-style-type: none"> • know • Know How
CG8	CG-08: Capacidade para identificar os diferentes elementos: recursos naturais renovables susceptibles de protección, conservación e aproveitamento.	<ul style="list-style-type: none"> • know • Know How • Know be
CG9	CG-09: Capacidade para analizar a estrutura e función ecolóxica dos sistemas e recursos forestais, incluíndo as paisaxes.	<ul style="list-style-type: none"> • know • Know How • Know be
CG31	CG-31: Capacidade para aplicar as técnicas de ordenación forestal e planificación do territorio, así como os criterios e indicadores da xestión forestal sostible no marco dos procedementos de certificación forestal.	<ul style="list-style-type: none"> • know • Know How
CE25	(*)CE-25: Capacidade para coñecer, comprender e utilizar os principios de: lexislación e certificación forestal; socioloxía e política forestal.	<ul style="list-style-type: none"> • know • Know How • Know be
CT1	(*)CBI 1: Capacidade de análise e síntese.	<ul style="list-style-type: none"> • know • Know How
CT2	(*)CBI 2: Capacidade de organización e planificación.	<ul style="list-style-type: none"> • know • Know How
CT11	(*)CBP 4: Habilidades de razoamento crítico.	<ul style="list-style-type: none"> • know • Know How • Know be
CT14	(*)CBS 2: Adaptación a novas situacións.	<ul style="list-style-type: none"> • know • Know How • Know be
CT15	(*)CBS 3: Creatividade.	<ul style="list-style-type: none"> • know • Know How • Know be
CT20	(*)CBS 8: Sensibilidade cara a temas ambientais.	<ul style="list-style-type: none"> • know • Know How • Know be

Learning outcomes

Learning outcomes	Competences
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(*)CE-25: Capacidad para conocer, comprender y utilizar los principios de: Legislación y certificación forestal; Sociología y Política forestal.	CB1 CB2 CG8
CE-25.1.- Introducir a los alumnos en conceptos jurídicos básicos	CG9
CE-25.2.- Formar al alumno en la terminología jurídica	CG31
CE-25.3.- Instruir al alumno en conocimiento práctico del derecho	CE25
CE-25.4.- Conocer el marco jurídico comunitario, español y autonómico	CT1
CE-25.5.- Conocer la estructura y funcionamiento de las instituciones autonómicas, nacionales y europeas.	CT2
CE-25.6.- Conocer las formas de contratación y los tipos de contratos de acuerdo con la Ley de procedimiento administrativo y la ley de contratos del Estado	CT11 CT14
CE-25.7.- Conocer y manejar la normativa básica en materia de la propiedad forestal	CT15
CE-25.8.- Conocer la legislación vigente en materia de montes a nivel comunitario y estatal.	CT20
CE-25.9.- Conocer la legislación autonómica vigente en materia de montes.	
CE-25.10.- Conocer la estructura, funcionamiento y la legislación especial de los Montes Vecinales en Mano Común.	
CE-25.11.- Conocer y manejar otra legislación que afecta a la actividad forestal y medioambiental.	
CE-25.12.- Conocer los procesos mundiales y las iniciativas desarrolladas en torno a los bosques.	
CE-25.13.- Conocer los acuerdos europeos que España ha firmado relativos a la protección de los bosques en Europa.	
CE-25.14.- Conocer los procesos mundiales para lograr la Gestión Forestal Sostenible.	
CE-25.15.- Conocer los principios mundiales y europeos de la certificación forestal.	
CE-25.16.- Conocer los Criterios e Indicadores paneuropeos y su forma de utilización.	
CE-25.17.- Conocer las Normas UNE 162.000 de Gestión Forestal Sostenible.	
CE-25.18.- Conocer los sistemas mundiales más implantados de certificación forestal PEFC y FSC.	
CE-25.19.- Aplicar de forma práctica la certificación forestal a una superficie. Seguimiento y auditorías.	

New

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.
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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
Tutored works	30	0	30
Others	20	0	20
Classroom work	66	0	66
Case studies / analysis of situations	30	0	30
Multiple choice tests	1	0	1
Practical tests, real task execution and / or simulated.	1	0	1
Case studies / analysis of situations	1	0	1
Troubleshooting and / or exercises	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
Tutored works	The student, individually or in groups, prepares a paper on the subject of matter or prepare seminars, research, memoirs, essays, summaries of readings, lectures, etc.. Generally it is an autonomous activity / of the student / s that includes finding and collecting information, reading and literature management, writing ...
Others	Works on practical cases of application of the subjects of the program. The basic competences CB1 and CB2 are developed, the general CG08, CG09 and CG3, the specific CE25 and the transversal ones CBI1, CBI2, CBP4, CBS2, CBS3 and CBS 8.
Classroom work	Students develop exercises or classroom projects under the guidance and supervision of the teacher. May link autonomous development of student activities.
Case studies / analysis of situations	Analysis of an event, issue or actual event in order to know, interpret, solve, generate hypotheses, comparing data, reflect, complete knowledge, diagnose and training in alternative dispute resolution procedures.

Personalized attention

Methodologies	Description
Case studies / analysis of situations	

Tutored works	
Others	
Classroom work	
Tests	Description
Multiple choice tests	
Practical tests, real task execution and / or simulated.	
Case studies / analysis of situations	
Troubleshooting and / or exercises	

Assessment			
	Description	Qualification	Evaluated Competences
Case studies / analysis of situations	(*)El trabajo es valorado y evaluado por los propios compañeros tras la presentación del mismo y por el profesor quien tendrá en consideración todos los factores señalados en el apartado de trabajos tutelados Se evalúan las competencias básicas CB1 y CB2, las generales CG08, CG09 y CG3, las específicas CE25 (CE 25.1 a 25.19) y las transversales CBI1, CBI2, CBP4, CBS2, CBS3 y CBS 8.	20	CB1 CB2 CG8 CG9 CG31 CE25 CT1 CT2 CT11 CT14 CT15 CT20
Tutored works	(*)Se valora por parte del profesor la dedicación del alumno, el interés y el desarrollo de los trabajos, su valoración se realiza el la evaluación final del estudio de casos presentado Se evalúan las competencias básicas CB1 y CB2, las generales CG08, CG09 y CG3, las específicas CE25 (CE 25.1 a 25.19) y las transversales CBI1, CBI2, CBP4, CBS2, CBS3 y CBS 8.	0	
Others	(*)Trabajo sobre las últimas materias de actualidad y disposiciones legales sobre materias forestales en trámite de aprobación o entrada en vigor Se evalúan las competencias básicas CB1 y CB2, las generales CG08, CG09 y CG3, las específicas CE25 (CE 25.1 a 25.19) y las transversales CBI1, CBI2, CBP4, CBS2, CBS3 y CBS 8.	10	CB1 CB2 CG8 CG9 CG31 CE25 CT1 CT2 CT11 CT14 CT15 CT20
Classroom work	(*)Se valora la asistencia y participación con seguimiento individual de los alumnos Se evalúan las competencias básicas CB1 y CB2, las generales CG08, CG09 y CG3, las específicas CE25 (CE 25.1 a 25.19) y las transversales CBI1, CBI2, CBP4, CBS2, CBS3 y CBS 8.	10	CB1 CB2 CG8 CG9 CG31 CE25 CT1 CT2 CT11 CT14 CT15 CT20

Multiple choice tests	(*)Se realiza una prueba tipo test al final de la asignatura a modo de examen final sobre los contenidos del temario que se han desarrollado en el curso y sobre las materias de las visitas y prácticas. Se evalúan las competencias básicas CB1 y CB2, las generales CG08, CG09 y CG3, las específicas CE25 (CE 25.1 a 25.19) y las transversales CBI1, CBI2, CBP4, CBS2, CBS3 y CBS 8.	40	CB1 CB2 CG8 CG9 CG31 CE25 CT1 CT2 CT11 CT14 CT15 CT20
Practical tests, real task execution and / or simulated.	(*)Consistirá en trabajos de discusión sobre materias del temario que se plantearán para debate. Se evalúan las competencias básicas CB1 y CB2, las generales CG08, CG09 y CG3, las específicas CE25 (CE 25.1 a 25.19) y las transversales CBI1, CBI2, CBP4, CBS2, CBS3 y CBS 8.	0	
Case studies / analysis of situations	(*)El trabajo es valorado y evaluado por los propios compañeros tras la presentación del mismo y por el profesor quien tendrá en consideración todos los factores señalados en el apartado de trabajos tutelados. Se evalúan las competencias básicas CB1 y CB2, las generales CG08, CG09 y CG3, las específicas CE25 (CE 25.1 a 25.19) y las transversales CBI1, CBI2, CBP4, CBS2, CBS3 y CBS 8.	20	CB1 CB2 CG8 CG9 CG31 CE25 CT1 CT2 CT11 CT14 CT15 CT20
Troubleshooting and / or exercises	(*)Resolución de casos prácticos relacionados con las materias del programa. Se evalúan las competencias básicas CB1 y CB2, las generales CG08, CG09 y CG3, las específicas CE25 (CE 25.1 a 25.19) y las transversales CBI1, CBI2, CBP4, CBS2, CBS3 y CBS 8.	0	

Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

Recommendations

IDENTIFYING DATA**Forest exploitation**

Subject	Forest exploitation			
Code	P03G370V01601			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Mandatory	3rd	2nd
Teaching language				
Department				
Coordinator	Ortiz Torres, Luis			
Lecturers	Ortiz Torres, Luis			
E-mail	lortiz@uvigo.es			
Web	http://http://dasometriaweb.blogspot.com.es/			
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	Typology
CB1 (*)Que os estudantes posúan e comprendan coñecementos que aporten unha base ou oportunidade de ser orixinal no desenvolvemento e / ou aplicación de ideas, a miúdo nun contexto de investigación	<ul style="list-style-type: none"> • know • Know How • Know be
CB2 Que los estudiantes sepan aplicar conocimientos adquiridos y su capacidad de resolución de problemas en entornos nuevos o poco conocidos dentro de contextos más amplios (o multidisciplinares) relacionados con su área de estudio	<ul style="list-style-type: none"> • know • Know How • Know be
CG8 CG-08: Capacidade para identificar os diferentes elementos: recursos naturais renovables susceptibles de protección, conservación e aproveitamento.	<ul style="list-style-type: none"> • know • Know How
CG23 CG-23: Capacidade para aplicar e desenvolver as técnicas de aproveitamento de produtos forestais madeirables e non madeirables.	<ul style="list-style-type: none"> • know • Know How
CE23 (*)CE-23: Capacidade para coñecer, comprender e utilizar os principios de: aproveitamentos forestais. Mellora forestal.	<ul style="list-style-type: none"> • know • Know How
CT1 (*)CBI 1: Capacidade de análise e síntese.	<ul style="list-style-type: none"> • know • Know How
CT2 (*)CBI 2: Capacidade de organización e planificación.	<ul style="list-style-type: none"> • know • Know How
CT5 (*)CBI 5: Capacidade de xestión da información.	<ul style="list-style-type: none"> • know • Know How
CT6 (*)CBI 6: Adquirir capacidade de resolución de problemas.	<ul style="list-style-type: none"> • know • Know How
CT7 (*)CBI 7: Adquirir capacidade na toma de decisións.	<ul style="list-style-type: none"> • know • Know How
CT11 (*)CBP 4: Habilidades de razoamento crítico.	<ul style="list-style-type: none"> • know • Know How
CT13 (*)CBS 1: Aprendizaxe autónoma.	<ul style="list-style-type: none"> • know • Know How
CT19 (*)CBS 7: Motivación pola calidade.	<ul style="list-style-type: none"> • know • Know How • Know be
CT20 (*)CBS 8: Sensibilidade cara a temas ambientais.	<ul style="list-style-type: none"> • know • Know How • Know be

Learning outcomes

Learning outcomes	Competences
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New

Contents

Topic	
General information on forestry and its market in the world	Definition and types of use The Forest Products Market The demand 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
Master Session	26	63	89
Troubleshooting and / or exercises	3	11	14
Case studies / analysis of situations	6	12	18
Outdoor study / field practices	10	18	28
Short answer tests	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
Master Session	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.
Troubleshooting and / or exercises	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 situations	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.
Outdoor study / field practices	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 attention

Methodologies	Description
Troubleshooting and / or exercises	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.
Outdoor study / field practices	It is a series of practical visits to facilities and mountains

Assessment

	Description	Qualification	Evaluated Competences
Master Session	(*)Asistencia e desempeño dedicado ás clases da materia. Se *evalúan 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	CT1 CT2 CT13 CT19
Outdoor study / field practices	(*)Asistencia ás saídas e práctica de campo organizadas.	10	
Case studies / analysis of situations	(*)Resolución dun suposto práctico de planificación que o alumno deberá realizar e entregar Se *evalúan 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	CT1 CT2 CT5 CT6 CT7 CT11 CT13 CT19
Short answer tests	(*)Resposta a preguntas relacionadas co temario Se *evalúan 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	CT1 CT6 CT7 CT11 CT13

Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

TOLOSANA, E. et al, El aprovechamiento maderero, Ediciones Mundi-Prensa, 2000

DALLA-PRIA, E et al, Manuel d'exploitation forestière. Tome I.et II, CTBA y ARMEF, 1995

MONTOYA, J. M., Los alcornocales, M.A.P.A. Madrid, 1988

ZAMORANO, J. L, Resinar de forma rentable, I.N.I.A. Madrid, 1995

ACEMM, Manual de prevención de riesgos laborales en el sector forestal, Fundación para la prevención de riesgos laborales. Gobierno de Cantabria, 2001

AAEF, Manual de prevención de riesgos laborales en el sector forestal, Junta de Andalucía, 2002

Recommendations

Subjects that continue the syllabus

Forestry machinery/P03G370V01502

Subjects that are recommended to be taken simultaneously

Dasometry/P03G370V01602

Subjects that it is recommended to have taken before

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				
Department				
Coordinator	Díaz Vázquez, Raquel			
Lecturers	Díaz Vázquez, Raquel			
E-mail	raquel.diaz.vazquez@gmail.com			
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	Typology
CE24 (*)CE-24: Capacidade para coñecer, comprender e utilizar os principios de: dasometría e inventariación forestal, ordenación de montes.	• know • Know How
CT6 (*)CBI 6: Adquirir capacidade de resolución de problemas.	• Know How

Learning outcomes

Learning outcomes	Competences
*CE-24.1: Know the basic concepts for the measurement of individual trees, the main variables used and the necessary technicians for his measurement.	CE24 CT6
The relation between competitions and results, and the weight of each competition inside the matter show in the pdf attach. http://forestales.uvigo.es/sites/default/files/24%20*Daso.Pdf#*overlay-*context=is/*content/competitions-and-resulted-of-learning-by-matter	

Contents

Topic	
0. Introduction to the Dasometry	<ol style="list-style-type: none">1. Why measure?2. Why measure trees and forest masses?3. Dasometry and affine sciences.4. Units of measure.5. Normalisation of symbols used in dasometry.6. Significant figures.7. Precision, bias and accuracy of the data.8. Errors.9. Weight or volume?10. Components of the tree.11. The form of the tree.12. Measurement by trip of fluid.13. Differences between quantity, value and price.
1. Measurement of Trees: Diameters	<ol style="list-style-type: none">1.1. Important terms.1.2. Basic dasometric parameters.1.3. Measurement of diameters of the trees.1.4. Measurement of the thickness of bark, diametral growth and age of the tree.1.5. Marked and designation of trees.1.6. Measurement of distances.

2. Measurement of Trees: Heights	2.1. Measurement of slopes. 2.2. Measurement of heights. 2.3. Recommendations for the measurement of heights. 2.4. Relascopio Of Bitterlich. 2.5. Other devices of the inventory. 2.6. Price devices dasometrycs.
3. Cubiculation By trozas.	3.1. Cubiculation Of trees. 3.2. Types dendrométricos. 3.3. Procedures for cubages of trees. 3.4. Formulas for cubages by trozas. 3.5. Rules madereras.
4. Cubages Complete trunks.	4.1. Graphic method. 4.2. Function of profile. 4.3. Formula of Pressler or of the point guideline. 4.4. Cubages Of trees in foot. Pressler-Bitterlich. 4.5. Parameters related with form: coefficients of form and mórphics.. 4.6. Height reduced.
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
Master Session	26	52	78
Troubleshooting and / or exercises	4	10	14
Case studies / analysis of situations	6	12	18
Outdoor study / field practices	14	24	38
Short answer tests	1	0	1
Reports / memories of practice	1	0	1

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

Methodologies

	Description
Master Session	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
Troubleshooting and / or exercises	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 / analysis of situations	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.
Outdoor study / field practices	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 attention

Methodologies	Description
Troubleshooting and / or exercises	
Outdoor study / field practices	

Assessment

	Description	Qualification	Evaluated Competences
Master Session	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) .	17.5	CE24
Short answer tests	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.	7.5	CE24 CT6
Reports / memories of practice	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.	7.5	CE24 CT6

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, 2003
MARTÍNEZ CHAMORRO, et al., Manual para a cubicación, taxación e venda de madeira en pe e biomasa forestal, Universidade de Vigo, 2012
MADRIGAL, A.; ÁLVAREZ, J.G.; RODRÍGUEZ, R.; ROJO, A., Tablas de producción para los montes españoles, Fundación Conde del Valle de Salazar, 1999
DIEGUEZ, U. et al., Herramientas Selvícolas para la Gestión Forestal Sostenible en Galicia, Xunta de Galicia, 2009
PRIETO RODRÍGUEZ, A.; LÓPEZ QUERO, M., Dasometría. Versión española de □Dendrométrie de L'ecole national du génie rural des aux et des forêts□, Editorial Paraninfo, 1994
ACEMM, Manual de prevención de riesgos laborales en el sector forestal, Fundación para la prevención de riesgos laborales. Gobierno de Cantabria, 2001

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
Forest exploitation/P03G370V01601

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				
Department				
Coordinator	González Prieto, Óscar			
Lecturers	Díaz Vázquez, Raquel González Prieto, Óscar Picos Martín, Juan			
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 opeaciones 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		Typology
CG6	CG-06: Capacidade para identificar os diferentes elementos: elementos bióticos.	• know • Know How
CG7	CG-07: Capacidade para identificar os diferentes elementos: elementos físicos.	• know • Know How
CG8	CG-08: Capacidade para identificar os diferentes elementos: recursos naturais renovables susceptibles de protección, conservación e aproveitamento.	• know • Know How
CG20	CG-20: Coñecemento das bases da mellora forestal e capacidade para a súa aplicación práctica á produción de planta e á biotecnoloxía.	• know • Know How
CE21	(*)CE-21: Capacidade para coñecer, comprender e utilizar os principios de: repoboacións forestais. Xardinería e viveiros.	• know • Know How
CT1	(*)CBI 1: Capacidade de análise e síntese.	• know • Know How
CT5	(*)CBI 5: Capacidade de xestión da información.	• Know How
CT6	(*)CBI 6: Adquirir capacidade de resolución de problemas.	• Know How
CT7	(*)CBI 7: Adquirir capacidade na toma de decisións.	• Know How
CT11	(*)CBP 4: Habilidades de razoamento crítico.	• Know How
CT13	(*)CBS 1: Aprendizaxe autónoma.	• Know How
CT14	(*)CBS 2: Adaptación a novas situacións.	• Know How • Know be
CT15	(*)CBS 3: Creatividade.	• Know be

Learning outcomes	
Learning outcomes	Competences
(*)	CG6 CG7 CG8 CG20 CE21 CT1 CT5 CT6 CT7 CT11 CT13 CT14 CT15

New

Contents

Topic	
Module I Planning and implementation of afforestation	<p>Theme 1. Concept and choice of species Lesson 1.1. Concept of afforestation and commentary Lesson 1.2. Background and need for afforestation Lesson 1.3. Objectives of afforestation Lesson 1.4. Species selection</p> <p>Topic 2. Methods of re-population Lesson 2.1. Types of methods Lesson 2.2. Selection of method</p> <p>Topic 3. Treatment of pre-existing vegetation Lesson 3.1. Rationale and objectives Lesson 3.2. Classification of clearing procedures Lesson 3.3. Description of the clearing procedures</p> <p>Topic 4. Soil preparation Lesson 4.1. Rationale and objectives Lesson 4.2. Classification of soil preparation procedures Lesson 4.3. Description of soil preparation procedures Lesson 4.4. Hydrological aspects of land clearing and soil preparation</p> <p>Topic 5. Introduction of new species Lesson 5.1. Density of introduction Lesson 5.2. Plantings Lesson 5.3. Plantations</p> <p>Item 6. Further care of restocking and complementary work Lesson 6.1. Subsequent care of restocking Lesson 6.2. Complementary works</p> <p>Topic 7. Environmental impact of reforestation Lesson 7.1. Introduction and regulations Lesson 7.2. Considerations on the environmental impact of forest R. Lesson 7.3. Affected Factors Lesson 7.4. Impact assessment Lesson 7.5. Methodological conclusion</p>
Module II Seeds	<p>Topic 8. General information on forest seeds Lesson 8.1. Harvest Lesson 8.2. Extraction and cleaning Lesson 8.3. Storage Lesson 8.4. Conservation Treatments Lesson 8.5. Analysis Lesson 8.6. Germination treatments Lesson 8.7. Sowing</p>
Module III Nurseries	<p>Topic 9. General information on forest nurseries Lesson 9.1. Definition and classes Lesson 9.2. Water Lesson 9.3. Floor Lesson 9.4. Location, shape and size Lesson 9.5. Bare root planting Lesson 9.6. Cultivation of plant in packaging Lesson 9.7. Staked Lesson 9.8. Quality of the forest plant Lesson 9.9. Mycorrhization</p>

Planning

	Class hours	Hours outside the classroom	Total hours
Master Session	25.5	47.5	73
Troubleshooting and / or exercises	8	14	22
Outdoor study / field practices	8	8	16
Integrated methodologies	1	11.5	12.5
Case studies / analysis of situations	10.5	14	24.5
Multiple choice tests	0.5	0	0.5
Short answer tests	0.5	0	0.5
Practical tests, real task execution and / or simulated.	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
Master Session	<p>The master lesson is the common form of development of the expository function, in which the teacher develops a series of concepts related to the contents of the Subject, and the student adopts a receptive role of this information.</p> <p>The use of audiovisual media (slides, transparencies, videos, video canon, etc.) will be constant in these classes since the retention of information is much greater when combining oral and visual stimuli.</p> <p>The masterful lesson serves to conceptually develop a theme, give global versions, develop a working methodology. etc.</p> <p>Depending on the progress of the course, the content of each didactic unit will be provided in advance and in writing, either as notes or as a bibliography, which enables the student to attend classes with previous reading of the topic. On the other hand, if the student knows that what is taught can be found in a book when studying, his attitude in the classroom will be directed to understand the explanation, having to take only marginal notes of what is expanded.</p> <p>In the case of this subject, the use of audiovisual media such as digital presentations, multimedia, transparencies, rear projection, etc. Should expedite the exposure of topics with a marked descriptive character, or in which drawings and schemes of complicated implementation are needed.</p> <p>The classes of directed discussion, will be made at least one throughout the course and consists of the presentation of a topic, which must meet characteristics of real problem, richness in contradictions or reasons for controversy, should be of interest to the students, who Must know the activity well enough and be sufficiently qualified to express opinions about it.</p> <p>The technique is oriented to overcoming uncritical memorization, fostering participation in the group and verbalization of ideas as a means that favors their assimilation. In addition, an important part of the pupils is a difficulty in expression and writing, which can contribute to overcome through this didactic resource. The role of the teacher as the conductor or moderator of the discussion is fundamental allowing all kinds of opinions on the subject.</p> <p>In addition, and in a complementary way to the lecture, after the presentation of controversial topics or of special interest for the students, it is interesting to organize discussions of reduced scope, questions, etc. Such an activity, which is simpler to perform than the previous one, can be considered more as a resource of elaboration and control within the master's lesson than as a technique of a nature alien to it.</p> <p>Other tools that help to reinforce the contents included in the master lessons are.</p> <ul style="list-style-type: none"> - Case study / situation analysis / directed discussion: Formulation, analysis, resolution and debate of a problem or exercise related to the thematic of the subject. - Solving problems and / or exercises in an autonomous way: Formulation, analysis, resolution and debate of a problem or exercise related to the subject matter of the subject. - Presentations / expositions: Oral presentation by the students of a specific subject or work (usually written presentation). - Multimedia Sessions: Use of videographic / online material on aspects of the subject - Study exits / field practices: Visits-outings to the field for the observation and study of aspects previously studied / analyzed
Troubleshooting and / or exercises	<p>Resolution of problems and / or exercises Formulation, analysis, Resolution and debate of a problem or exercise related to the theme of the Subject, by the students.</p> <p>Exercises and problems will be carried out on topics such as: static study of forest masses, dynamic study of the forest masses, etc</p>

Outdoor study / field practices	<p>The practice of the techniques, theoretically learned, must be carried out in contact with the professional practice which can only be obtained by actual practice of the techniques (or their direct observation) wherever they are carried (Industry, forest masses, etc.)</p> <p>The practice of techniques, theoretically learned, must be carried out in close contact with professional practice which can only be obtained by practicing techniques (or their direct observation) wherever they are carried out (industry, forest masses, etc.).</p> <p>The maximum number of field practices or practical trips should be carried out, without which theoretical teaching is insufficient to achieve the teaching objectives.</p> <p>The field practices are therefore intended to establish the concepts of the subject, give students the opportunity to get in touch with the professional world and foster relationships between students and teacher student outside the center. The realization of practical trips make sense when they really contribute new knowledge that are impossible to acquire in the School itself.</p>
Integrated methodologies	<ul style="list-style-type: none"> - Organization of specific seminars or conferences - Presentations / exhibitions: Oral presentation by the students of a theme Concrete or work (usually written presentation). - Multimedia Sessions: Use of videographic / online material on aspects of the subject - Days of study of aspects previously studied / analyzed in field trips
Case studies / analysis of situations	Case study / situational analysis - Case study / situation analysis or directed discussion: Formulation, analysis, resolution and debate of a problem or exercise related to the subject matter of the subject ..

Personalized attention

Methodologies	Description
Case studies / analysis of situations	
Troubleshooting and / or exercises	
Outdoor study / field practices	

Assessment

	Description	Qualification	Evaluated Competences
Case studies / analysis of situations	(*).	30	CG6 CG7 CG8 CG20 CE21 CT6 CT7 CT11 CT13 CT14 CT15
Integrated methodologies	(*).	0	
Master Session	(*).	0	
Multiple choice tests	(*).	30	CG6 CG7 CG8 CG20 CE21
Short answer tests	(*).	40	CG6 CG7 CG8 CG20 CE21 CT1 CT11

Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

Recommendations

Subjects that are recommended to be taken simultaneously

Botany/P03G370V01303

Forestry Ecology/P03G370V01402

Subjects that it is recommended to have taken before

Biology: Plant Biology/P03G370V01201

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				
Lecturers				
E-mail				
Web	http://http://www.forestales.uvigo.es/			
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	Typology
CG15 CG-15: Capacidade para o uso das técnicas de restauración hidrolóxico forestal.	<ul style="list-style-type: none"> • know • Know How
CE9 (*)CE-09: Capacidade para coñecer, comprender e utilizar os principios de: hidráulica forestal; hidroloxía e restauración hidrolóxico-forestal.	<ul style="list-style-type: none"> • know • Know How
CT20 (*)CBS 8: Sensibilidade cara a temas ambientais.	<ul style="list-style-type: none"> • Know be

Learning outcomes	
Learning outcomes	Competences
Knowing the main characteristics of hydrologic cycle , understanding and skilled in the methods of assessment precipitation evaporation , infiltration and runoff at water basin forest	CG15 CE9 CT20
New	

Contents	
Topic	
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 margines rivers Design of breakwaters Pavers background Deflectors

Planning

	Class hours	Hours outside the classroom	Total hours
Practice in computer rooms	10	10	20
Autonomous troubleshooting and / or exercises	30	30	60
Outdoor study / field practices	3	3	6
Master Session	30	30	60
Troubleshooting and / or exercises	3	0	3
Short answer tests	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
Practice in computer rooms	I handle of software draw computer-aided for treatment of watershed. By means of this methodology develop the competitions A19 and A62
Autonomous troubleshooting and / or exercises	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
Outdoor study / field practices	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

Master Session 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 attention

Methodologies	Description
Autonomous troubleshooting and / or exercises	

Assessment

	Description	Qualification	Evaluated	Competences
Troubleshooting and / or exercises	Practical supposition for his resolution. By means of this methodology evaluate the competitions A19 and A62	30		CG15 CE9
Short answer tests	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		CG15 CE9

Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

Recommendations

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	Fernández Alonso, José María			
Lecturers	Fernández Alonso, José María González Prieto, Óscar Ortiz Torres, Luis			
E-mail	txema182@gmail.com			
Web				
General description	(*)(*)Durante el curso de Ordenación de Montes se analizarán los diferentes métodos para la Durante o curso de Ordenación de Montes analizaranse os diferentes métodos para a organización e xestión do aproveitamento dos recursos naturais forestais. A ensinanza basearase no repaso da historia forestal europea e da paralela evolución dos métodos de ordenación. A presentación de problemas permitirá introducir as distintas solucións e a aprendizaxe das mesmas por parte do alumno.			

Competencies

Code		Typology
CG6	CG-06: Capacidade para identificar os diferentes elementos: elementos bióticos.	• know • Know How
CG7	CG-07: Capacidade para identificar os diferentes elementos: elementos físicos.	• know • Know How
CG8	CG-08: Capacidade para identificar os diferentes elementos: recursos naturais renovables susceptibles de protección, conservación e aproveitamento.	• know • Know How
CG9	CG-09: Capacidade para analizar a estrutura e función ecolóxica dos sistemas e recursos forestais, incluíndo as paisaxes.	• know • Know How
CG31	CG-31: Capacidade para aplicar as técnicas de ordenación forestal e planificación do territorio, así como os criterios e indicadores da xestión forestal sostible no marco dos procedementos de certificación forestal.	• know • Know How
CE24	(*)CE-24: Capacidade para coñecer, comprender e utilizar os principios de: dasometría e inventariación forestal, ordenación de montes.	• know • Know How
CT1	(*)CBI 1: Capacidade de análise e síntese.	• know • Know How
CT2	(*)CBI 2: Capacidade de organización e planificación.	• Know How
CT5	(*)CBI 5: Capacidade de xestión da información.	• Know How
CT11	(*)CBP 4: Habilidades de razoamento crítico.	• Know How

Learning outcomes

Learning outcomes	Competences
(*)CE-23.1	CG6 CG7 CG8 CG9 CG31 CE24 CT1 CT2 CT5 CT11
New	

Contents

Topic

Objectives of Forest Management	Definitions and concept Spanish Forest History Conditioning and Tools Objectives of Forest Management Types of Forest Production
Structure and content of Mountain Management Projects	The classic project Structure and content of the Projects
Forestry and Economic Foundations of Forest Management	Silvicultural bases of management Investment analysis Criteria for the determination of the shift and age of maturity
Application Regulations for Ordinance Projects	Application regulations
Impacts of Forestry Activity in the Management Project	Main Impacts Visual impact assessment

Planning

	Class hours	Hours outside the classroom	Total hours
Master Session	26	52	78
Troubleshooting and / or exercises	4	10	14
Case studies / analysis of situations	6	12	18
Teaching and/or informatives events	4	6	10
Outdoor study / field practices	10	18	28
Short answer tests	1	0	1
Reports / memories of practice	1	0	1

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

Methodologies

	Description
Master Session	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.
Troubleshooting and / or exercises	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 situations	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.
Teaching and/or informatives events	Conferences, lectures, exhibitions, panel discussions, debates ... performed by renowned speakers, which you can drill or supplement the contents of the field.
Outdoor study / field practices	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 attention

Methodologies	Description
Troubleshooting and / or exercises	
Outdoor study / field practices	

Assessment

	Description	Qualification	Evaluated Competences
Short answer tests	(*)Respuesta a preguntas relacionadas con el temario	80	CG6 CG7 CG8 CG9 CG31 CE24 CT11

Reports / memories of practice	(*)Realización de una memoria con la metodología y los resultados de las prácticas	20	CG6 CG7 CG8 CG9 CG31 CE24 CT1 CT2 CT5 CT11
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Other comments on the Evaluation

Sources of information

Basic Bibliography

MADRIGAL, A, Ordenación de Montes Arbolados, ICONA, 1994

Complementary Bibliography

GONZALEZ MOLINA, et al., Manual de Ordenación por Rodales, Centre Tecnologic Forestal de Catalunya, 2006

DAVIS, L. S.; JOHNSON, K. N.; BETTINGER, P. S.; HOWARD, T. E, Forest Management (4th ed.), McGraw Hill Publishing Co., 2001

MADRIGAL, A.; ÁLVAREZ, J.G.; RODRÍGUEZ, R.; ROJO, A., Tablas de producción para los montes españoles, Fundación Conde del Valle de Salazar, 1999

DÍAZ-MAROTO, I., Evolución de los métodos de ordenación de montes en España. Situación actual., Escuela Politécnica Superior, Lugo, 1995

ACEMM, Manual de prevención de riesgos laborales en el sector forestal, Fundación para la prevención de riesgos laborales. Gobierno de Cantabria, 2001

DIEGUEZ, U. et al., Herramientas Selvícolas para la Gestión Forestal Sostenible en Galicia, Xunta de Galicia, 2009

MARTÍNEZ CHAMORRO, et al., Manual para a cubicación, taxación e venda de madeira en pe e biomasa forestal, Universidade de Vigo, 2012

Manual de ordenación de montes de Andalucía, Junta de Andalucía, 2004

Recommendations

Subjects that continue the syllabus

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

Forest exploitation/P03G370V01601

Dasometry/P03G370V01602

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				
Department				
Coordinator	Bartolome Mier, Javier			
Lecturers	Bartolome Mier, Javier			
E-mail	jbartolome@uvigo.es			
Web	http://www.forestales.uvigo.es			
General description	*Asignatura In which it studies the wood like industrial prime matter, his characteristics and properties			

Competencies	
Code	Typology
CG32 CG-32: Capacidade para caracterizar as propiedades anatómicas e tecnolóxicas das materias primas forestais madeirables así como das tecnoloxías e industrias destas materias primas.	• know • Know How
CT19 (*)CBS 7: Motivación pola calidade.	• Know be
CT20 (*)CBS 8: Sensibilidade cara a temas ambientais.	• Know be

Learning outcomes	
Learning outcomes	Competences
Capacity to relate the principles of anatomical structure intern and properties of the wood with his potentiality for the supply to the forest industry	CG32 CT19 CT20
New	

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
Master Session	29	72	101
Laboratory practises	10	20	30
Outdoor study / field practices	4	8	12
Introductory activities	1	0	1
Short answer tests	2	0	2
Reports / memories of practice	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
Master Session	Exhibition of aims and contents and importance of the same inside the group of competitions of the subject.
Laboratory practises	Realisation and individual presentation and in groups of works of laboratory
Outdoor study / field practices	Explanation in situ of industrial and technical processes of laboratory
Introductory activities	Initial explanation of the aims and development of the subject.

Personalized attention	
Methodologies	Description
Laboratory practises	

Assessment			
	Description	Qualification	Evaluated Competences
Master Session	Continuous evaluation through the assistance to the classes of classroom	20	CG32
Laboratory practises	Continuous evaluation through the assistance to the practices of laboratory	5	CG32 CT19 CT20
Short answer tests	Realisation of partial proofs and finals	70	CG32
Reports / memories of practice	Realisation and presentation of the memories of the practices of laboratory	5	CG32 CT19 CT20

Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

Recommendations

Subjects that continue the syllabus

Primary wood processing industries/P03G370V01706
Wood preservation and drying technology/P03G370V01705

Subjects that it is recommended to have taken before

Physics: Physics I/P03G370V01102
Physics: Physics II/P03G370V01202
Botany/P03G370V01303

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				
Department				
Coordinator	Ortiz Torres, Luis			
Lecturers	Ortiz Torres, Luis			
E-mail	lortiz@uvigo.es			
Web	http://www.webs.uvigo.es/lortiz			
General description	(*)procesos de transformación física y conversión energética de biomasa			

Competencies

Code		Typology
CG2	CG-02: Capacidade para comprender os seguintes fundamentos necesarios para o desenvolvemento da actividade profesional: Físicos.	• know • Know How
CG8	CG-08: Capacidade para identificar os diferentes elementos: recursos naturais renovables susceptibles de protección, conservación e aproveitamento.	• know • Know How
CG23	CG-23: Capacidade para aplicar e desenvolver as técnicas de aproveitamento de produtos forestais madeirables e non madeirables.	• know • Know How
CG33	CG-33: Capacidade para caracterizar as propiedades anatómicas e tecnolóxicas das materias primas forestais non madeirables así como das tecnoloxías e industrias destas materias primas.	• know • Know How
CE26	(*)CE-26: Capacidade para coñecer, comprender e utilizar os principios de: procesos industriais xiloenerxéticos.	• know • Know How
CT3	(*)CBI 3: Capacidade de comunicación oral e escrita tanto na lingua vernácula como en linguas estranxeiras.	• know • Know How
CT8	(*)CBP 1: Capacidades de traballo en equipo, con carácter multidisciplinar e en contextos tanto nacionais como internacionais.	• Know be
CT13	(*)CBS 1: Aprendizaxe autónoma.	• Know How

Learning outcomes

Learning outcomes	Competences
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(*)CE-26: Capacidad para conocer, comprender y utilizar los principios de: Procesos industriales xiloenergéticos.	CG2 CG8 CG23
CE-26.1.-Aprender las técnicas para el aprovechamiento energético de la biomasa fo-restal e industrial	CG33
CE-26.2 Comprender los conceptos básicos sobre las energías xilogeneradas, unida-des, etc	CE26
CE-26.3 Comprender los aspectos ecológicos y de sostenibilidad a tener en cuenta en las explotaciones y plantaciones de biomasa con fines energéticos	CT3 CT8
CE-26.4 Comprender las técnicas de laboratorio para el cálculo de parámetros físicos, químicos y energéticos de la biomasa	CT13
CE-26.5 Conocer los sistemas y metodologías para el cálculo de poderes caloríficos (pcs, pci), humedad (b.h/,b.s.), productos volátiles, % cenizas,% C fijo, distribuciones granulométricas parciales y acumuladas, densidad, etc	
CE-26.6 Conocer las técnicas y sistemas industriales de cosechado, astillado, empaca-do, secado natural, secado forzado, cribado y reducción granulométrica mediante mo-lienda de los residuos forestales y de las industrias de la madera	
CE-26.7 Conocer los métodos y equipos industriales para la densificación de biomasa lignocelulósica mediante procesos de briquetado y peletizado	
CE-26.8 Conocer los equipos, técnicas, sistemas y maquinaria para la transformación física y conversión energética de biomasa	
CE-26.9 Conocer los fundamentos del cálculo de parámetros básicos de combustión (aire estequimétrico, emisiones contaminantes, rendimientos, etc)	
CE-26.10 Conocer los equipos de combustión convencional, combustión en lecho fluidizado, gasificación, pirólisis, carbonización	
CE-26.11 Conocer las técnicas y sistemas para la obtención de biocombustibles líqui-dos como bioalcohol y biodiesel	
CE-26.12 Conocer los equipos y sistemas para la producción de energía eléctrica con biomasa, turbinas de vapor, turbinas de gas, motores, etc	
CE-26.13 Conocer las principales especies y sistemas para la implantación y gestión de cultivos energéticos de corta rotación	
<hr/>	
New	
<hr/>	

Contents

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

Planning			
	Class hours	Hours outside the classroom	Total hours
External practises	18	36	54
Laboratory practises	5	10	15
Master Session	26	52	78
Long answer tests and development	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
External practises	These are visits to industrial installations
Laboratory practises	These are lab work and pilot plant of xylenogenic energies
Master Session	These are classroom classes

Personalized attention	
Methodologies	Description
Master Session	It refers to the theory classes held in the classroom
External practises	These are visits to industrial facilities
Laboratory practises	Laboratory work and pilot plant of xylogen energies

Assessment			
	Description	Qualification	Evaluated Competences
External practises	(*)Valorarase a asistencia ás clases presenciais e visitas/prácticas de campo	20	CG2 CG8 CG23 CG33 CE26 CT3 CT8 CT13
Laboratory practises	(*)Valoraranse os traballos/exercicios realizados durante as mesmas.	20	CG2 CG8 CG23 CG33 CE26 CT3 CT8 CT13
Long answer tests and development	(*)Avaliarase mediante un exame final	60	CG2 CG8 CG23 CG33 CE26 CT3 CT8 CT13

Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

Recommendations

IDENTIFYING DATA**Environmental management**

Subject	Environmental management			
Code	P03G370V01608			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	3rd	2nd
Teaching language				
Department				
Coordinator	Ortiz Torres, Luis			
Lecturers	Martínez Chamorro, Enrique José Ortiz Torres, Luis			
E-mail	lortiz@uvigo.es			
Web	http://www.webs.uvigo.es/lortiz			
General description	(*)metodos e sistemas de xestión medioambiental			

Competencies

Code	Typology
CG18 CG-18: Capacidade para aplicar as técnicas de auditoría.	• Know How
CG19 CG-19: Capacidade para aplicar as técnicas de xestión ambiental.	• Know How
CE38 (*)CE-38: Capacidade para coñecer, comprender e utilizar os principios de: xestión ambiental da industria forestal.	• know • Know How
CT1 (*)CBI 1: Capacidade de análise e síntese.	• know • Know How
CT2 (*)CBI 2: Capacidade de organización e planificación.	• Know How
CT11 (*)CBP 4: Habilidades de razoamento crítico.	• Know How
CT14 (*)CBS 2: Adaptación a novas situacións.	• Know be
CT15 (*)CBS 3: Creatividade.	• Know be
CT20 (*)CBS 8: Sensibilidade cara a temas ambientais.	• Know be

Learning outcomes

Learning outcomes	Competences
(*)CE-38.- Capacidad para conocer, comprender y utilizar los principios de: Gestión ambiental de la industria forestal.	CG18 CG19 CE38
CE-38.1.- Conocer los principales problemas de la contaminación atmosférica.	CE38
CE-38.2.- Conocer los principales elementos y actividades que producen la contaminación atmosférica.	CT1
CE-38.3.- Conocer las principales tecnologías para el tratamiento de las emisiones por gases.	CT2
CE-38.4.- Conocer las principales sustancias contaminantes de los efluentes líquidos.	CT11
CE-38.5.- Conocer los principales sistemas de tratamiento y depuración de efluentes líquidos y de aguas residuales.	CT14 CT15 CT20
CE-38.6.- Conocer los tipos de residuos sólidos y su composición.	CT20
CE-38.7.- Conocer los principales tratamientos de residuos sólidos.	
CE-38.8.- Conocer las técnicas de compostaje para residuos forestales y materia orgánica.	
CE-38.9.- Conocer las principales tecnologías de digestión anaerobia para el tratamiento de residuos sólidos.	
CE-38.10.- Conocer las principales técnicas del reciclado sobre todo de materiales procedentes de industrias de papel y cartón.	
CE-38.11.- Conocer los principales sistemas de tratamiento de residuos tóxicos y peligrosos.	
CE-38.12.- Conocer y estudiar las nuevas fuentes de energías alternativas.	
CE-38.13.- Conocer los principios básicos de la cogeneración.	
CE-38.14.- Conocer la normativa medioambiental.	
CE-38.15.- Conocer los principios básicos de los estándares y de las auditorías medioambientales	
CE-38.16.- Conocer y saber aplicar las normas ISO de gestión medioambiental.	
CE-38.17.- Conocer los reglamentos EMAS de la normativa de gestión medioambiental y su aplicación.	
CE-38.18.- Realizar un estudio práctico de gestión medioambiental.	

New

Contents

Topic

A. ATMOSPHERIC POLLUTION	<ul style="list-style-type: none"> A.1. ENVIRONMENTAL POLLUTANTS A.2. EFFECTS OF ATMOSPHERIC POLLUTION A.3. DESTRUCTION OF THE OZONE LAYER A.4. GLOBAL QUALITY <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> B.2. MANAGEMENT SYSTEMS: B.3. PHYSICO-CHEMICAL WATER PARAMETERS B.4. RESIDUAL WATER CONTAMINANTS B.5. RESIDUAL WATER PURIFICATION SYSTEMS <ul style="list-style-type: none"> B.5.2. Primary treatment <ul style="list-style-type: none"> B.5.2.1. Physical and Chemical Treatments B.5.3. Secondary treatment <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> C.1. LOS R.S.U. C.2. TREATMENT SYSTEMS <ul style="list-style-type: none"> C.2.2. CONTROLLED SHIFT <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> D.1. THE COMPOUND PROCESS <ul style="list-style-type: none"> D.1.1. PHYSICAL PARAMETERS D.1.2. COMPOUND SYSTEMS <ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> E.1. THE ANAEROBIA DIGESTION E.2. PARAMETERS OF OPERATION AND CONTROL OF THE ANAEROBIC PROCESSES E.3. ANAEROBIA DIGESTION TECHNOLOGY <ul style="list-style-type: none"> E.3.1. Discontinuous digesters E.3.2. Continuous digesters <ul style="list-style-type: none"> E.3.2.1. Digesters with suspended biomass E.3.3. Two Phase Digester E.4. CONTROLLED VERTEDERO E.5. ANAEROBIA DIGESTION FACILITIES <ul style="list-style-type: none"> 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.- DISFRANCO
 - F.6.2.3.-DEPURACION
 - 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
Outdoor study / field practices	20	40	60
Case studies / analysis of situations	10	0	10
Autonomous troubleshooting and / or exercises	9	20	29
Master Session	17	33	50
Long answer tests and development	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
Outdoor study / field practices	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 / analysis of situations	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 troubleshooting and / or exercises	This is to present flow diagrams of the facilities visited during the course
Master Session	These are theoretical classes in the classroom

Personalized attention

Methodologies	Description
Outdoor study / field practices	These are views of industrial facilities
Case studies / analysis of situations	It is a practical work and present it publicly

Assessment

	Description	Qualification	Evaluated Competences
Outdoor study / field practices	(*)Valórase a asistencia dos alumnos ás saídas prácticas	10	CG18 CG19 CE38 CT1 CT11 CT14 CT20
Case studies / analysis of situations	(*)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	CG18 CG19 CE38 CT1 CT2 CT11
Master Session	(*)Valorarase a asistencia ás clases.	10	
Long answer tests and development	(*)Avaliaranse os coñecementos adquiridos durante o desenvolvemento da materia.	60	

Other comments on the Evaluation

Sources of information

Basic Bibliography

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Gil, Manuel, Depuración de aguas residuales, 1, CSIC, 2013, Madrid

Seoanez, Mariano, Manual de aguas residuales industriales, 1, Mac Graw Hill, 2012, Madrid

Picoraio, Simona, Gestión de residuos Urbanos, 1, CEYSA, 2016, Madrid

Seoanez, Mariano, Tratado de la contaminación atmosférica, 1, Mundi Prensa, 2012, Madrid

Complementary Bibliography

Recommendations