



IDENTIFYING DATA

Chemical industries of the wood, cellulose, pulp and paper

Subject	Chemical industries of the wood, cellulose, pulp and paper			
Code	P03G370V01805			
Study programme	(*)Grao en Enxeñaría Forestal			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	2nd
Teaching language	Spanish Galician			
Department				
Coordinator				
Lecturers	Valero Gutiérrez del Olmo, Enrique María			
E-mail				
Web				
General description				

Competencies

Code	
B1	Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area.
B11	Ability to characterize the anatomical and technological properties of wood and non-timber forest raw materials, as well as the technologies and industries of these raw materials.
C37	Knowledge of the basic principles of the chemical transformation of wood and its industrial processes, in particular cellulose and paper.
D2	Ability to communicate orally and written in Spanish or in English
D5	Capacity for information management, analysis and synthesis
D10	Autonomous Learning

Learning outcomes

Expected results from this subject	Training and Learning Results
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2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.	B1	C37	D2
3R. 2018 Be conscious of the multidisciplinary context of the engineering.			D5
4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.			D10
5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.			
6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.			
7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.			
8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.			
9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.			
10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study.			
11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.			
12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.			
13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.			
14R. 2018 Capacity to apply norms of engineering in the his speciality.			
17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions			
20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines.			

Contents

Topic

1º Part: chemical Industry of the wood: Industry of the paste and of the paper

1. Paste, paper and cardboard. Requests and sources of fibres *papeleras. Chemical composition of the wood. Behaviour of the fibres *celulósicas.
2. Characteristics of the wood. Effect of the morphology of the fibres on the properties of the paper. Identification of wooden species.
3. The resources of the wood. Measure of the wood for paste. Preparation of the wood for the manufacture of cellulose. Control of quality of the *astillas.
4. Processes of obtaining of pastes. Mechanical pastes, chemical, *semiquímicas and pastes to dissolve. Comparison of pastes and applications of the same.
5. The process to the sulphate. Definition of terms and description of the process *kraft. System of recovery of the chemical products. Chemistry of the process *kraft and variables that affect to the cooking to the sulphate.
6. Teams of cooking. Discontinuous and continuous digesters. *Designificación Widespread.
7. Treatment of the pastes: *Desfibrado, elimination of knots, wash, classification of pastes, thickened, pumping, stored, mixed, dried, cut and *apilado.
8. Recovery of the bleaches of cooking. Evaporation. Boiler of recovery. *Caustificación. Calcination. Recovery of by-products.
9. Bleaching of pastes. Sequences *ECF and *TCF. Stages of bleaching. Closing of circuits.
10. Economy and strategy of operation of a factory of pastes. Control of costs.
11. Preparation of the paste for the manufacture of the paper: Disintegration, *refinado, measure and mix of the composition.
12. Utilisation of secondary fibres. Disintegration of the *papelote and *destintado.
13. Additives no fibrous in the manufacture of the paper.
14. Manufacture of the paper □ splits humid and dry part.
15. Reduction of the aqueous and atmospheric pollution in the industry *celulósica and *papelera

2º Part: Other forest chemical industries

16. Derived of the cellulose.
17. Extracts of the wood and his applications.
18. Resinación. Resin.
19. Sacarificación Of the wood. *Bioetanol.
20. Biorefinerías.

Planning

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

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

Methodologies

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

Personalized assistance

Methodologies	Description
Lecturing	
Laboratory practical	
Studies excursion	
Case studies	

Assessment

Description	Qualification	Training and Learning Results			
Lecturing	70	B1	C37		
		B11			
Laboratory practical	10	B11	C37		
Studies excursion	10	B11		D2	
				D5	
				D10	
Problem solving	10			D2	
				D5	

Other comments on the Evaluation

Sources of information

Basic Bibliography

Complementary Bibliography

Recommendations

Other comments

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

Contingency plan

Description

=== EXCEPTIONAL PLANNING ===

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

=== ADAPTATION OF THE METHODOLOGIES ===

* Teaching on line

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

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

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

=== ADAPTATION OF The EVALUATION ===

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