1A FISA	CU 6.2
Semester 6	5 School ECTS - 0 Company ECTS

CU 6.2: STABILISATION AND PROTECTION PRODUCTS AND METHODS

Director of studies: Arnaud BESSERER

General CU objectives:

• Identify biotic and abiotic agents responsible for wood degradation.

• Select and implement the most suitable products and processes for preservation, drying and finishing, fireproofing for optimal use of timber in service.

• Recommend methods for measuring the performance of preservation treatments, finish coatings and the quality of drying.

• Analyse and exploit experimental results, based on technical information and standards.

Consists of:

- Module 1: Biology of timber deterioration and preventive solutions
- Module 2: Finishes and fireproofing
- Module 3: Timber Drying
- Module 4: Cross-cutting project

Hourly volume

In-person	*Self-directed study*
28.00 H Lectures	**80.00 H**
48.00 H Tutorials	
0.00 H Practicals	

Positioning of the CU in the School reference system:

semester 6

Units of skills

In accordance with the RNCP sheet

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CU 6.2: STABILISATION AND PROTECTION PRODUCTS AND METHODS

Module 1: Biology of timber deterioration and preventive solutions	**Coefficient 2**
Session leaders: Arnaud BESSERER, Marie Christine TROUY, Philippe GERARDIN (LERMAB)	
Teaching assistants: Marie-Laure ANTOINE, Christelle PERRIN	
Prerequisites: CU 5.3	
Teaching materials: Course notes – Presentation slides – Reading list – Arche page – Project	
Assessment methods: individual Class assignment– Viva– Report– Practical examination	

Learning outcomes	**Description**	**Number of student hours (in-person)**		
		Lectures	**Tutorials**	**Practicals**
Identify and describe the risk factors favouring the development of wood degradation organisms and bio-based materials. Use this knowledge with a view to supporting a diagnostic approach. Describe the different processes and types of preservatives used in the timber industry. Choose an industrial wood treatment process suited to the use and species of the wood. Explain the effectiveness of the different treatments by the anatomical properties of the types of wood.	Biology of wood degradation organisms.	10.50		
	Wood preservation Products and processes	3.50		
		14.00	**0.00**	**0.00**

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Module 2: Finishes and fireproofing	**Coefficient 1**
Session leaders: Emmanuel FREDON, Caroline SIMON, Eric MASSON	
Teaching assistants: Marie-Laure ANTOINE, Christelle PERRIN	
Prerequisites: CU 5.3	
Teaching materials: Course notes – Presentation slides – Reading list – Arche page – Project	
Assessment methods: individual Class assignment– Viva	

Learning outcomes	**Description**	**Number of student hours (in-person)**		
		Lectures	**Tutorials**	**Practicals**
Choose or recommend a product, a finishing process in an integrated approach to the long-term aesthetic protection of timber, for indoor and outdoor use. Research, decipher and exploit technical information or information from scientific studies in the field of adhesives. Recommend tests to characterise coatings according to standards and reference systems and exploit experimental results. Choose a flame-retardant product. Understand and use the regulations.	General purpose of timber finishes properties conferred on coatings and related physical characteristics The different products on the market, their composition and comparative performance Binders: their function, film formation, differentiated drying methods Finishing cycles and systems, Selection criteria	3.50	2.00	
	Application and drying processes Application practice based on data sheets	1.75		
	Causes of ageing and standardised study and analysis devices Thermomechanical properties of finishes, glass transition concept Comparative measurement and analysis of physical properties of coatings		2.00	
	Reaction to fire: flame-retardant treatments and modes of action National ranking and Euroclasses	1.75		
		7.00	**4.00**	**0.00**

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Module 3: Timber Drying	**Coefficient 1**
Session leaders: Romain REMOND and Eric MOUGEL	
Teaching assistants: Tristan STEIN	
Prerequisites: CU 5.3 and CU 5.4	
Teaching materials: Course notes – Presentation slides	
Assessment methods: individual and in groups Class assignment– Practical examination	

Learning outcomes	**Description**	**Number of student hours (in-person)**		
		Lectures	**Tutorials**	**Practicals**
Identify and describe the different drying phases, and the evolution of mechanical stresses in the plank. Analyse the quality of drying according to the conditions applied. Know the different drying processes used in the timber industry. Apply a drying process. Adapt the drying process according to the observed defects.	Moisture and heat transfer mechanisms and drying kinetics. Wood mechanics and development of drying constraints via hygrovariations. Main drying defects and their causes.	3.50	2.00	
	The practice of drying: The different processes and their conduct.	3.50	2.00	
		7.00	**4.00**	**0.00**

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Module 4: Cross-cutting project	**Coefficient 2**
Session leaders: Romain REMOND, Eric MOUGEL, Emmanuel FREDON, Marie-Christine TROUY, Arnaud BESSERER, Caroline SIMON	
Teaching assistants:	
Prerequisites:	
Teaching materials: Project - Company documents	
Assessment methods: Individual Report	

Learning outcomes	**Description**	**Number of student hours (in-person)**		
		Lectures	**Tutorials**	**Practicals**
Characterise an industrial timber treatment process according to the use and species of the wood. Characterise the products, cycles and finishing processes according to technical, economic and ecological criteria of aesthetic effect, use. Know the different drying processes implemented. Apply a drying process. Adapt the drying process according to the observed defects.	The project will be based on company data and will be adapted according to the use made by the apprentice's company (if necessary, the information will come from its suppliers or customers). Use of European standards for the choice of wood species or preservation treatments for implementation. Choice of the finishing treatment process and evaluation of its effectiveness, based on the product data sheets and constraints. Company's application and drying processes. Practice used by the company (if existing or suppliers if necessary).		40.00	
		0.00	**40.00**	**0.00**

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