1A FISE	CU 6.2
Semester 6	5 School 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: Not applicable

Hourly volume

In-person		*Self-directed study*
28.00 H	**Lectures**	**80.00 H**
8.00 H	**Tutorials**	
40.00 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. Use a European standard in the field of wood preservation to evaluate the effectiveness of preservatives. Analyse and draw a conclusion from experimental results. 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		
	Implementation of a European standard for testing the efficacy of wood preservation products involving the handling of wood-destroying organisms.			10.00
	Wood preservation Products and processes	3.50		
	Implementation of different processing methods and macro and microscopic visual analysis.			8.00
		14.00	**0.00**	**18.00**

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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		4.00
	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	6.00
	Reaction to fire: flame-retardant treatments and modes of action. National ranking and Euroclasses.	1.75		
		7.00	**4.00**	**10.00**

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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	8.00
	The practice of drying: The different processes and their conduct.	3.50	2.00	4.00
		7.00	**4.00**	**12.00**

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