



ADVANCED TANNING PROCESSES DESIGN

COORDINATION

COMBALIA CENDRA, FELIP

ACADEMIC YEAR

2023-2025

SUBJECT GENERAL INFORMATION

Subject name	ADVANCED TANNING PROCESSES DESIGN			
Code	1SEM-SUB5			
Typology	1st semester. Continued evaluation.			
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Degree	Course	Character	Modality
	Joint Master Degree in Leather Technology	1	Compulsory	Blended learning
Coordination	COMBALIA CENDRA, FELIP			
University	UdL			
Language	English			

LEARNING OBJECTIVES

1. Understand the chemical fundamentals in beamhouse and tanning processes.
2. Recognize the environmental impact of each operation in beamhouse and tanning processes. Recognize the nature of waste products generated in the process and its basic management.
3. Solve technical problems in beamhouse and tanning processes. Suggest solutions through process redesign.
4. Design advanced formulations of soaking, unhairing and liming, deliming and bating, degreasing, pickling and chrome tanning, vegetable tanning and pretannage wet-white.
5. Analyse the variables that affect the parameters of touch, physical resistance, strength and fineness grain, goodness dyeing as leading exponents of leather quality.
6. Schedule in a practical way the production of different leather articles until the tanning process.
7. Recognize different types of leather and identify the applications that they have.

LEARNING OUTCOMES

Basic

CB6 Possess and understand knowledge that provides a basis or opportunity to be original in the development and / or application of ideas, often in a research context.

CB10 That students have the learning skills that allow them to continue studying in a way that will be largely self- directed or autonomous.

General

CG1 Appropriately apply mathematical, analytical, scientific, instrumental, technological and management aspects.

CG2 Technically and economically manage projects, facilities, plants, companies and technology centres.

CG3 Research, develop and innovate.

Specific

CE2 Analyse, apply and project the main unit operations and the systems that make up the leather manufacturing process.

CE4 Apply theories and principles of leather engineering in order to analyse complex situations and make decisions using engineering resources.

CE5 Identify the main industrial processes of leather manufacturing in its three phases: beamhouse, tanning and post-tanning and finishing.

CE9 Project, calculate and design products, processes, facilities and plants, related to the field of leather engineering.

SUBJECT CONTENT

1. CHARACTERISTICS OF LEATHER

1.1 Major aspects and characteristics that define leather

- Touch
- Loose grain
- Physical resistance
- Fineness grain
- Fineness plush
- Fullness, thickness, surface
- Water repellence, water absorption
- Dyeing
- Other

1.2 Raw hide

- Furs exploitable worldwide
- Location and characteristics
- Systems of conservation prior to the transformation process of skin.

2. BEAMHOUSE OPERATIONS

2.1 Beamhouse processes

- Generalities

2.2 Soaking

- Understanding the process: objectives. Reagents and chemical process.
- Soaking systems.
- Solution or compensation of problems that may have occurred at other stages. Connection between this operation and the final article.
- Sustainability of the process.

2.3 Unhairing

- Understanding the process: objectives. Reagents and chemical process.
- Soaking systems.
- Solution or compensation of problems that may have occurred at other stages. Connection between this operation and the final article.

- Sustainability of the process.

2.4 Fleshing and splitting:

- Understanding the process: Objectives Machinery of the process.
- Connection between these operations and the final article. Sustainability of the process.

3. OPERATIONS PRIOR TO TANNING

3.1 Processes prior to tanning

- Generalities

3.2 Deliming

- Reagents and chemical process.
- Deliming systems. Solution or compensation of problems that may have occurred at other stages. Connection between this operation and the final article.
- Sustainability of the process.

3.3 Bating

- Understanding the process: objectives. Reagents and chemical process.
- Bating systems.
- Solution or compensation of problems that may have occurred at other stages. Connection between this operation and the final article.
- Sustainability of the process.

3.4 Degreasing

- Understanding the process: objectives. Reagents and chemical process.
- Degreasing systems.
- Solution or compensation of problems that may have occurred at other stages. Connection between this operation and the final article.
- Sustainability of the process.

3.5 Pickling

- Understanding the process: objectives. Reagents and chemical process.
- Pickling systems.
- Solution or compensation of problems that may have occurred at other stages.
- Connection between this operation and the final article.
- Sustainability of the process.

METHODOLOGY

THEORY CLASSES

Expository lectures: by the teacher, with the explanation of concepts, materials and work plan.

Support material: Course notes and relevant bibliography.

Specific objectives: At the end of the course the student should be able to:

- Know the different raw materials used in leather manufacturing.
- Specificities and conservation systems.
- Meet every stage of processing from the skin to the tanned leather (beamhouse, pretanning and tanning processes).
- Design processes based on the requirements of the final article. Acquire judgment to modify processes based on existing problems in the leather.

EXERCISES AND SELFSTUDY

General description: Individual exercises, self-learning and individual study. Support material: Course notes and relevant bibliography.

Deliverable: Exercises to deliver at the end of every unit via digital campus.

Specific objectives: At the end of the course students should have increased their abilities to: Solve problems, reading understanding, find information, self-study.

PRACTICES IN THE TANNING PILOT PLANT

General description: Formulations of different processes will be performed on a pilot level, individually or in small groups. It should be performed a notebook where to recorded all the modifications of the process and used products during the process.

Support material: Practices are held at the tanning pilot plant. All materials and reagents are in the same pilot plant. The scripts of the processes will be provided by the teacher in charge of monitoring practices.

Deliverable: At the end of these practices the student shall deliver the practices report, which will content note of all the data, calculations, incidents, and observations.

EVALUATION

Exercises	15%
Practices	30%
Exam 1	20%
Exam 2	35%