



## ADVANCED WET-END PROCESSES DESIGN

**COORDINATION**  
BAŞARAN, BAHRİ

**ACADEMIC YEAR**  
2023-2025

### SUBJECT GENERAL INFORMATION

Subject name	ADVANCED WET-END PROCESSES DESIGN			
Code	2SEM-SUB1			
Typology	2nd semester. Continued evaluation.			
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	<i>Degree</i>	<i>Course</i>	<i>Character</i>	<i>Modality</i>
	<i>Joint Master Degree in Leather Technology</i>	<i>1</i>	<i>Compulsory</i>	<i>Blended learning</i>
Coordination	BAŞARAN, BAHRİ			
University	EG			
Language	English			

## LEARNING OBJECTIVES

1. Understand the chemical fundamentals in wet-end processes.
2. Recognize the environmental impact of each differentiated operation in wet-end processes.
3. Solve technical problems in wet-end processes.
4. Suggest solutions for possible defects and redesign the process.
5. Analyse the variables that affect the leather quality.
6. Recognize and identify of differentiates of the leathers.
- 7.

## 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.

### Transversal

CT2 Efficiently use digital technologies in their professional field.

### 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 TANNED LEATHERS

#### L1.1 Introduction of the Course:

Content, Importance, Rules, and Requirements  
Definition of pelt, tanning theories and history, Properties conferred to leather by tanning, leather forming criterions, classification of tanning materials.  
Chemical bonds for stabilization and modification of collagen, Properties of tanned leathers  
Touch, Physical resistance, Grain fineness, Fullness, Thickness, Shrinkage  
Temperature.

#### L1.2 Characteristics of leathers differentiated in tanning

Appearance, physical and chemical difference of vegetable/metal/semi/synthetic tanned leathers

### 2. WET-END OPERATIONS

#### L2.1 Wet-End processes

Generalities.

#### L2.2 Neutralization

Objectives of the process.  
Reagents and chemical process.  
Neutralization procedure.  
Process defects and solutions.

#### L2.3 Dyeing, Retanning, Fatliquoring

Objectives of the processes.  
Reagents and chemical processes.  
Dyeing, Retanning, Fatliquoring systems  
Process defects and solutions.

#### L2.4 Mechanical Process

Objectives.  
Machinery of the processes.  
Process defects and solutions.

### 3. DIFFERENTIATED WET-END PROCESSES

#### L3.1 Different Wet-End Processes

Generalities.

#### L3.2 Vegetable Tannins Based Wet-End Systems

Objectives of the process.  
Reagents and chemical process.  
Vegetable tanning-based wet-end operations  
Process defects and solutions.

#### L3.3 Semi Wet-End Systems

Objectives of the process.  
Reagents and chemical process.  
Semi wet-end procedures.

Process defects and solutions.

#### L3.4 Synthetic Based Wet-End Systems

Objectives of the process.

Reagents and chemical process.

Semi tanning based wet-end procedures

Process defects and solutions.

#### L3.5 Metal Based Wet-End Systems

Objectives of the process.

Reagents and chemical process.

Metal based wet-end procedures.

Process defects and solutions.

## METHODOLOGY

### THEORY CLASSES

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

Material: Course notes and relevant bibliography.

### EXERCISES AND SELF STUDY

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.

### PRACTICES IN THE 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 record all the modifications of the process and used products during the process.

Support material: Practices are held at the pilot plant. All materials and reagents are in the 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%