Universitat de Lleida

DEGREE CURRICULUM

ADVANCED DESIGN OF TANNING PROCESSES 1

Coordination: COMBALIA CENDRA, FELIP

Academic year 2023-24

ADVANCED DESIGN OF TANNING PROCESSES 1 2023-24

Subject's general information

<table>
<tr><td>Subject name</td><td>ADVANCED DESIGN OF TANNING PROCESSES 1</td></tr>
<tr><td>Code</td><td>103150</td></tr>
<tr><td>Semester</td><td>1st Q(SEMESTER) CONTINUED EVALUATION</td></tr>
<tr><td>Typology</td><td>
<table>
<tr><th>Degree</th><th>Course</th><th>Character</th><th>Modality</th></tr>
<tr><td>Master's Degree in Leather Engineering</td><td>1</td><td>COMPULSORY</td><td>Attendance-based</td></tr>
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<tr><td>Course number of credits (ECTS)</td><td>5</td></tr>
<tr><td>Type of activity, credits, and groups</td><td>
<table>
<tr><th>Activity type</th><th>PRALAB</th><th>PRAULA</th><th>TEORIA</th></tr>
<tr><td>Number of credits</td><td>2.5</td><td>1</td><td>1.5</td></tr>
<tr><td>Number of groups</td><td>1</td><td>1</td><td>1</td></tr>
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</td></tr>
<tr><td>Coordination</td><td>COMBALIA CENDRA, FELIP</td></tr>
<tr><td>Department</td><td>INDUSTRIAL AND BUILDING ENGINEERING</td></tr>
<tr><td>Teaching load distribution between lectures and independent student work</td><td>in-person class: 40%
autonomous: 60%</td></tr>
<tr><td>Important information on data processing</td><td>Consult this link for more information.</td></tr>
<tr><td>Language</td><td>Catalan
Spanish
English</td></tr>
<tr><td>Distribution of credits</td><td>Theoretical credits: 2,5 ECTS
Praula credits: 1 ECTS
Pralab credits: 1,5 ECTS</td></tr>
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ADVANCED DESIGN OF TANNING PROCESSES 1 2023-24

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
COMBALIA CENDRA, FELIP	felip.combalia@udl.cat	5	

Subject's extra information

It is **COMPULSORY** that the students bring the following elements of individual protection (EPI) to the practices at the laboratory.

- Laboratory gown from UdL
- Protection glasses
- Mechanical protection gloves

They can be purchased through the shop Údels of the UdL:

C/ Jaume II, 67 baixos
Centre the Cultures i Cooperació Transfronterera

http://www.publicacions.udl.cat/

There will be a specific service for the *Campus Universitari d'Igualada*.

The use of other elements of protection (for example caps, masks, gloves of chemical or electrical risk, etc.) will depend on the type of practice to be done. In that case, the teacher will inform of the necessity of specific EPI.

Not bringing the EPI's described or not fulfilling the norms of general security that are detailed below imply that the student can not access to the laboratories or have to go out of them. The no realisation of the practices for this reason imply the **consequences in the evaluation** of the subject that are described in this course guide.

GENERAL NORMS OF SECURITY IN LABORATORY PRACTICES

- Keep the place of realisation of the practices clean and tidy. The table of work has to be free from backpacks, folders, coats...
- No short trousers or short skirts are allowed in the laboratory.
- Closed and covered footwear is compulsory in the laboratory.
- Long hair needs to be tied.
- Keep the laboratoy gown laced in order to be protected from spills of chemicals.
- Bangles, pendants or wide sleeves are not allowed as they can be trapped.
- Avoid the use of contact lenses, since the effect of the chemical products is much bigger if they enter between the contact lense and the cornea. Protection over-glasses can be purchased.
- No food or drink is allowed in the laboratory.
- It is forbidden to smoke in the laboratories.
- Wash your hands whenever you have contact with a chemical product and before going out of the laboratory.
- Follow the instructions of the teacher and of the laboratory technicians and ask for any doubt on security.

For further information, you can check the following document of the *Servei de Prevenció de Riscos Laborals de la UdL*: http://www.sprl.udl.cat/alumnes/index.html

ADVANCED DESIGN OF TANNING PROCESSES 1 2023-24

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. Analyze the variables that affect the parameters of touch, physical resistance, strenght 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.

Competences

Basic

B06. To 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.

B07. That students know how to apply the knowledge acquired and have the ability to solve problems in new or little-known environments (or multidisciplinary) contexts related to their area of study.

B10 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. To apply properly mathematical, analytical, scientific, instrumental, technological and management aspects.

CG2. To technically and economically manage projects, facilities, plants, companies and technology centers.

CG3. To investigate, develop and innovate.

CG4.Lead, plan and supervise multidisciplinary teams.

Transversal

CT1. Communicate clearly and precisely orally and in writing in Catalan and Spanish and in a third language, especially English.

CT3. Propose innovative, creative and entrepreneurial solutions in situations typical of the professional field.

CT4. Evaluate the sustainability and social impact of the proposed proposals and act with ethical, environmental and professional responsibility.

Specific

CE1. Analyze the different raw materials, intermediate and final products in the leather manufacturing process.

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

CE4. To apply theories and principles of leather engineering in order to analyze complex situations and make decisions through engineering resources.

CE5. To identify the main industrial processes of leather manufacturing in its three phases: beamhouse phase, tanning and re-tanning phase and finishing phase.

CE10. Design strategic planning and apply it to production, quality and environmental management systems in the field of leather engineering.

Subject contents

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.

Methodology

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

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Development plan

Week	Methodology	Units	In-person hours	Autonomous hours
1	Master class/virtual/ exercices	1.1	5	7.5
2	Master class/virtual/ exercices	1.2	5	7.5
3	Master class/virtual/ exercices	2.1 /2.2	5	7.5
4	PROCESS DESIGN 1 PRACTICES			
5	Master class/virtual/ exercices	2.2/2.3	5	7.5
6	CHEMICAL PROCESS PRACTICES			
7	Master class/virtual/ exercices	2.3	5	7.5
8		2.4	5	7.5
9	PARTIAL EXAMS			
10	Master class/virtual/ exercices	3.1	5	7.5
11	Master class/virtual/ exercices	3.2	5	7.5
12	CHEMICAL PROCESSES PRACTICES 2			
13	Master class/virtual/ exercices	3.3/3.4	5	7.5
14	FINISHING PRACTICES			
15	Master class/virtual/exercices	3.4/3.5	5	7.5
16	PARTIAL EXAMS			
17	PARTIAL EXAMS			
18	TUTORING			
19	RECUPERATION EXAMS			

Evaluation

Exercises	10%
Practices	30%
Exam 1	20%
Exam 2	30%
Visits	5%
Informs	5%

Bibliography

Basic:

Soler, J. Procesos de Curtidos. Igualada: EUETII-ESAI,2000. ISBN 84-1837-2-5

Soler, J. Diseño de Procesos de Curtidos. Igualada:EUETII-ESAI,2005. ISBN 84-931837-6-8

Supplementary:

Adzet, J.M. Química Técnica de Teneria. Igualada: EUETII-ESAI, 1985.

Bacardit, A.;Ollé, Ll. Maquinaria de Curtidos. Igualada: EUETII-ESAI, 2005. ISBN 84-931837-4-1

Font, Joaquim. Análsis y ensayos en la Industria del Curtido. Igualada: EUETII-ESAI, 2005. ISBN 84-931837-5-X

Gerhard, J. Posibles fallos en el cuero y en su producción. [s. l.]: Lampertheim: G. John , 1998.

Morera, J.M. Química Tecnica de Curtición . Igualada: EUETII-ESAI, 2000. ISBN 84-931837-0-9

O'Flaherty,F.(Ed). [et al.]. "The Chemistry and Technology of Leather". USA: Malabar, Krieger Pub., 1978.