



Course guides

320085 - DPTER - Design of Dyeing, Printing and Coating Processes

Last modified: 29/05/2020

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 702 - CEM - Department of Materials Science and Engineering.

Degree: BACHELOR'S DEGREE IN TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009). (Compulsory subject).

Academic year: 2020 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: Riba Moliner, Marta

Others: Casadesus Fuste, Marta

PRIOR SKILLS

Previously studying the subject Materials for Textile Product Design is highly desirable.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

CE20. TEX: Applied knowledge of sizing and finishing processes

CE23. TEX: knowledge of unitary operations of preparing, dyeing and blanching

CE25. TEX: Knowledge of the chemical compound behaviour for the for the textile ennoblement.

TEACHING METHODOLOGY

- Presential sessions for delivery of the topics with active student involvement.
- Presential sessions of practical work.
- Self-directed study and report preparation. Cooperative learning.
- Preparation and conduct of assessable activities in groups.

LEARNING OBJECTIVES OF THE SUBJECT

GLO1. To become a professional in the design of colour spaces and of technologies for continuous dyeing, printing and coating in the framework of quality and safety management of processes and products.

GLO2. To acquire the ability to know the network of dyeing and finishing industries, and the technical specifications for finished textiles with a view to their integration into the body of operations of the textile production process.

GLO3. To develop the specific and transversal skills associated to the academic work.



STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours large group	30,0	20.00
Hours small group	30,0	20.00

Total learning time: 150 h

CONTENTS

Topic 1: DESIGN OF CONTINUOUS DYEING PROCESSES

Description:

- 1.1. Continuous dyeing machinery.
- 1.2. Pad-Batch processes.
- 1.3. Thermosol process.
- 1.4. Pad-Steam processes.
- 1.5. Continuous washing processes.
- 1.6. Simulation criteria for continuous processes.
- 1.7 Optimization criteria for dyeing processes.

Specific objectives:

- SO1. To produce laboratory test planning forms.
- SO2. To assess the accuracy of laboratory tests.
- SO3. To know the reproducibility criteria for different continuous dyeing methods.
- SO4 To plan process and product quality control tests.
- SO5. To understand the result specification criteria used in international trade

Related activities:

RA0, RA1

Full-or-part-time: 50h

Theory classes: 10h

Laboratory classes: 10h

Self study : 30h



Topic 2: DESIGN OF PRINTING PROCESSES

Description:

- 2.1. Printing paste rheology.
- 2.2. Classification of printing techniques and design effects.
- 2.3. Main criteria for for the assessment of printed fabrics.
- 2.3. Printing assessment criteria.
- 2.4. Printing machinery.
- 2.5. Machinery for dye fixation and aftertreatment
- 2.6. Analysis of industrial printing sequences.
- 2.7. Control criteria for printing processes.

Specific objectives:

- SO6. To know the reproducibility criteria for various dyestuff application methods.
SO7. Assay planification for process and product quality control.
SO8. To understand the result specification criteria used in international trade
SO9. To understand the relationships) between colour spaces and textile products design.

Related activities:

RA2, RA3, RA4

Full-or-part-time: 50h

Theory classes: 10h

Laboratory classes: 10h

Self study : 30h

Topic 3: TEXTILE COATING PROCESSES

Description:

- 3.1. Application fields for textile coated materials.
- 3.2. Technical specifications of the substrates for coating.
- 3.3. Application of Chemical formulae and fields of use.
- 3.4. Coating techniques.

Specific objectives:

- SO10 Knowledge of the reproducibility criteria for (various) coating methods.

Related activities:

RA3, RA4, RA5

Full-or-part-time: 50h

Theory classes: 10h

Laboratory classes: 10h

Self study : 30h

GRADING SYSTEM

Students will be assessed in a continual manner for self-directed learning and team work. The presence to practical work is mandatory. Only 2 justified absences will be accepted. Knowledge and skill acquisition will be assessed as follows:

- First evaluation: 30%.
- Second evaluation: 30%.
- Laboratory technical reports: 30%
- Presentation of technical rapport: 10%

The recovery of the first exam will take a written test, the second day of the exam, then the same with grade 0 to grade 5. replace the initial qualification provided they exceed

Teachers may at any time ask students to justify the conclusions of their reports in order to verify that they have been actively engaged in the activities.

For those students who meet the requirements and submit to the reevaluation examination, the grade of the reevaluation exam will replace the grades of all the on-site written evaluation acts (tests, midterm and final exams) and the grades obtained during the course for lab practices, works, projects and presentations will be kept.

If the final grade after reevaluation is lower than 5.0, it will replace the initial one only if it is higher. If the final grade after reevaluation is greater or equal to 5.0, the final grade of the subject will be pass 5.0.

BIBLIOGRAPHY

Basic:

- Cegarra, J.; Puente, P.; Valldeperas, J. Fundamentos científicos y aplicados de la tintura de materias textiles. Barcelona: UPC, 1981. ISBN 8460021343.
- Canal, J. M. Innovacions i processos de preparació i blanqueig. Terrassa: EUETIT, 2007.
- Shishoo, R. Plasma technologies for textiles. Boca Raton: Woodhead/CRC, 2007. ISBN 9781420044508.
- Gordon, S.; Hsieh, Y-H. Cotton: science and technology. Boca Raton: Woodhead/CRC, 2007. ISBN 9780849391019.
- Burkinshaw, S. M. Chemical principles of synthetic fibre dyeing. London: Blackie Academic & Professional, 1995. ISBN 0751400432.
- Johnson, Alan. The theory of coloration of textiles. 2nd ed. Bradford: Society of Dyers and Colourists, 1989. ISBN 0901956481.
- Canal, J. M. Criteris per a la innovació de processos de tintura en base a la MTD. Terrassa: EUETIT, 2007.
- Brown, P. J.; Stevens, K. Nanofibers and nanotechnology in textiles. Boca Raton: CRC, 2007. ISBN 9781845691059.
- Marco, Ángel. Los colorantes reactivos en la tintura de fibras celulósicas y sus mezclas. Barcelona: Asociación Española de Químicos y Coloristas Textiles, 2004.
- Heywood, Derek. Textile finishing. Bradford: Society of Dyers and Colourists, 2003. ISBN 0901956813.