Course guide
205556 - 205556 - Advances in Textile Finishes and Dressings

Last modified: 11/04/2025

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

Degree: MASTER'S DEGREE IN TEXTILE DESIGN AND TECHNOLOGY (Syllabus 2020). (Compulsory subject).

Academic year: 2025 **ECTS Credits:** 5.0 **Languages:** English

LECTURER

Coordinating lecturer: Coordinador: Marta Riba

Others: Mònica Ardanuy
Meritxell Martí

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
MUDITT-CE4. The ability to manage and optimize advanced finishing processes.

Generical:
CG3. Lead, plan and supervise multidisciplinary teams.
MUDITT-CG5. Carry out strategic planning and apply it to production, quality and environmental management systems in the field of textile design and technology.
MUDITT-CG1. Apply mathematical, analytical, scientific, instrumental, technological and management knowledge related to the field of textile design and technology.
MUDITT-CG2. Project, calculate and design products and processes related to the field of textile design and technology.
MUDITT-CG4. Carry out research, development and innovation in the field of textile design and technology.

Transversal:
CT1. ENTREPRENEURSHIP AND INNOVATION: Being aware of and understanding how companies are organised and the principles that govern their activity, and being able to understand employment regulations and the relationships between planning, industrial and commercial strategies, quality and profit.

Basic:
CB06. Manage original concepts in research projects.
CB07. Student capacity to use their knowledge in new and multidisciplinary situations.
CB08. Generate decision from incomplete information assuming its social and ethical responsibilities.
CB09. Improve technical communication of results.
CB10. Improve self-learning capacity

TEACHING METHODOLOGY

The teaching methodology is based on:
â□□ Face-to-face sessions of presentation of the contents and problema-solving exercicis.
â□□ Face-to-face laboratory work sessions.
â□□ Autonomous work of study and realization of exercises and activities.
In the sessions of presentation-participation of the contents, the professor will introduce the theoretical bases of the matter, concepts, methods and results illustrating them with convenient examples and requesting, if necedssary, the realization of exercises, to facilitate his comprehension.
In the laboratory work sessions, the teacher will guide the students in the application of the theoretical concepts for the resolution of experimental questions, based at all times on critical reasoning. Activities will be proposed that the student solves in the classroom and outside the classroom, to favor the contact and use of the basic tools necessary for the realization of an instrumentation system.
Students, autonomously, have to work on the material provided by the teachers and the result of the work-problem sessions to assimilate and fix the concepts. Teachers will provide a study and activity monitoring plan (ATENEA).

LEARNING OBJECTIVES OF THE SUBJECT

At the end of the course the student must:
Being able to incorporate emerging technologies and products in textile finishing processes.

STUDY LOAD

Type	Hours	Percentage
Hours small group	45,0	36.00
Self study	80,0	64.00

Total learning time: 125 h

CONTENTS

Module 1: Introduction

Description:
1.1. General Introduction to Innovations in Textile Finishing
1.2. Introduction to Supramolecular Chemistry
1.3. Advanced surface modification techniques: plasma, nano-coatings, dip-coating, spin-coating, micro-contact Printing, micro-spraying, among others.

Related activities:
AF1. Theoretical work sessions in the classroom (face-to-face)
AF2. Resolution of exercises, problems, and cases, possibly with computer support, with the participation of the student in the classroom (face-to-face)
AF4. Preparation and performance of assessable individual or group activities (not face-to-face)
AF5. Autonomous study work and exercises (not face-to-face)
AF6. Tutoring and formative evaluation of the learning process (no presence)

Full-or-part-time: 25h
Laboratory classes: 9h
Self study : 16h

Module 2: Application of advanced wet techniques

Description:
2.1. The sol-gel process, among others
2.2. Examples of application in textile finishings

Related activities:
AF1. Theoretical work sessions in the classroom
AF2. Resolution of exercises, problems, and cases, possibly with computer support, with the participation of the student in the classroom
AF3. Practical work sessions in the laboratory
AF4. Preparation and performance of assessable individual or group activities
AF5. Autonomous study work and exercises
AF6. Tutoring and formative evaluation of the learning process

Full-or-part-time: 25h
Laboratory classes: 9h
Self study : 16h

Module 3: Application of the micro-nano encapsulation in textile finishes

Description:
3.1. The micro-nano encapsulation process
3.2. Examples of application of micro-nano encapsulation in textile materials

Related activities:
AF1. Theoretical work sessions in the classroom
AF2. Resolution of exercises, problems and cases, possibly with computer support, with the participation of the student in the classroom
AF3. Practical work sessions in the laboratory
AF4. Preparation and performance of assessable individual or group activities
AF5. Autonomous study work and exercises
AF6. Tutoring and formative evaluation of the learning process

Full-or-part-time: 25h
Laboratory classes: 9h
Self study : 16h

Module 4: Application of advanced dry techniques

Description:
4.1. Plasma treatments among others
4.2. Examples of the application of treatments in textiles

Related activities:
AF1. Theoretical work sessions in the classroom
AF2. Resolution of exercises, problems and cases, possibly with computer support, with the participation of the student in the classroom
AF3. Practical work sessions in the laboratory
AF4. Preparation and performance of assessable individual or group activities
AF5. Autonomous study work and exercises
AF6. Tutoring and formative evaluation of the learning process

Full-or-part-time: 25h
Laboratory classes: 9h
Self study : 16h

Module 5: Multifunctional finishings

Description:
5.1.Multifunctional finishings
5.2. Examples of application of multifunctional finishes in textile materials

Related activities:
AF1. Theoretical work sessions in the classroom
AF2. Resolution of exercises, problems and cases, possibly with computer support, with the participation of the student in the classroom
AF3. Practical work sessions in the laboratory
AF4. Preparation and performance of assessable individual or group activities
AF5. Autonomous study work and exercises
AF6. Tutoring and formative evaluation of the learning process

Full-or-part-time: 25h
Laboratory classes: 9h
Self study : 16h

GRADING SYSTEM

Exam 1: 20%
Exam 2: 20%
Exercises and practical cases: 30%
Reports of laboratory work: 30%.
For those students who meet the requirements and take the reevaluation exam, the grade of the reevaluation exam will substitute the marks of all the evaluation acts that are face-to-face written tests (controls, midterms and final exams) and the practical grades will be maintained: laboratory reports, exercises and presentations obtained during the course.
If the final grade after the reevaluation is lower than 5.0, it will replace the initial one only if it is higher. If the final grade after the reevaluation is greater than or equal to 5.0, the final grade for the course will be 5.0.

BIBLIOGRAPHY

Basic:
- Shishoo, R. Plasma technologies for textiles [on line]. Boca Raton [etc.]: Woodhead/CRC, cop. 2007 [Consultation: 09/07/2024]. Available on: https://www-sciencedirect-com.recursos.biblioteca.upc.edu/book/9781845690731/plasma-technologies-for-textiles. ISBN 9781420044508.
- Horrocks, A.R.; Anand, S. Handbook of technical textiles. Vol. 1, Technical textile applications [on line]. 2nd ed. Cambridge UK: Woodhead Publishing; Textile Institute, 2016 [Consultation: 04/11/2022]. Available on: https://www-sciencedirect-com.recursos.biblioteca.upc.edu/book/9781782424581/handbook-of-technical-textiles. ISBN 9781782424819.
- Montazer, M.; Harifi T. Nanofinishing of textile materials. Duxford, Eng: Woodhead Publishing, 2018. ISBN 9780081012147.
- Hu, Jinlian. Active coatings for smart textiles. Duxford, UK: Woodhead Publishing, 2017. ISBN 9780081002636.