320194 - TDP - Textiles for Product Design

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 714 - ETP - Department of Textile and Paper Engineering
Academic year: 2018
Degree: BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Teaching unit Optional)
ECTS credits: 6
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: Carrera Gallissà, Enric
Others: Carrera Gallissà, Enric
Ventura, Heura

Opening hours
Timetable: To be arranged with each student

Prior skills
Not having completed a Bachelor's Degree in Textile Design and Technology

Requirements
Not having completed a Bachelor's Degree in Textile Design and Technology

Teaching methodology
Sessions of theory
Sessions of practical work at laboratory

Learning objectives of the subject
OE1: To have a general view of the possibilities that the textile materials and technologies for product design
OE2: To be capable to solve design problems with textile materials

Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 30h</th>
<th>30h</th>
<th>20.00%</th>
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<tr>
<td></td>
<td>Hours small group:</td>
<td>30h</td>
<td>20.00%</td>
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<tr>
<td></td>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
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### Content

<table>
<thead>
<tr>
<th>Chapter 1. Introduction to the textile and clothing industry</th>
<th>Learning time: 5h</th>
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<tbody>
<tr>
<td>Description:</td>
<td>Theory classes: 2h</td>
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<tr>
<td>Structure of the textile industry</td>
<td>Self study: 3h</td>
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<tr>
<td>Socioeconomic importance</td>
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<tr>
<td>Uses of textiles</td>
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<tr>
<td>Basic nomenclature of textiles</td>
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<tr>
<td>The concept of textile design</td>
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<tr>
<td>Specific objectives:</td>
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<tr>
<td>Know and understand the structure of the textile cycle, its socioeconomic importance, the nomenclature and the main applications of the products obtained by this industry, as well as the concept of textile design</td>
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<tr>
<th>Item 2. Textile fibers and their possibilities in product design</th>
<th>Learning time: 40h</th>
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<tbody>
<tr>
<td>Description:</td>
<td>Theory classes: 6h</td>
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<tr>
<td>Classification of textile fibers. abbreviations</td>
<td>Laboratory classes: 4h</td>
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<tr>
<td>Natural fibers of plant, animal and minerals</td>
<td>Self study: 30h</td>
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<tr>
<td>Man made fibers</td>
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<tr>
<td>Main physical properties that influence the design</td>
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<tr>
<td>Major chemical properties that influence the design</td>
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<td>Textile Labelling</td>
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<tr>
<td>Related activities:</td>
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<tr>
<td>P1. Identification microscopy and organoleptic textile fibers</td>
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<td>P2. Marches analytical identification of textile fibers</td>
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<td>Specific objectives:</td>
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<tr>
<td>Learn to textile fibers classified by their nature. Know the main properties of textile fibers from the perspective of engineering design and labeling legislation. Learn to identify the main textile fibers with optical microscopy techniques and analytical gears</td>
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</table>
### Item 3. Spinning and processes from the perspective of design

**Description:**
- Properties of wires and their influence on the design of textiles
- Cotton spinning process: Opening and cleaning of fibers, Card, Draw frame, Roving, Ring spinning, OE spinning, air jet spinning, spinning friction, coil twisted.
- Worsted spinning process
- Process of spinning wool carding
- Process spinning regenerated

**Related activities:**
- P3. Determination title and twisting wires
- P4. Workshop on the practical operation of the main machines of the spinning process

**Specific objectives:**
- Know and understand the basic operations of spinning processes, the characteristics of cotton spinning processes, yarn, wool carding and regenerated and the main properties of the wires from the perspective of product design. Learn practical way to determine the main properties of the threads as tittle, twisting and retaliation, as well as the regularity of mass.

### Item 4. Woven fabrics, knitting and weaving from the perspective of design

**Description:**
- Fundamentals of Theory woven
- Ligaments basic: Plain, tweet and Ras.
- Principles of double fabric, cloth both sides, and special fabrics Jacquard
- Design ligaments puff
- Operation and pierced mesh looms
- Knitted fabric and its applications
- Properties of tissues that influence product design

**Related activities:**
- P5. Workshop on the practical operation of the shed looms
- P6. Workshop CAD design fabrics

**Specific objectives:**
- Learn the basics of the theory of woven and ligaments fundamental bases of complex derivatives and ligaments as well as the main tools used in the design of ligaments woven. Learn the basics of knittef fabrics and applications. Learn practical way the main tests used to characterize tissue from the perspective of product design.
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<table>
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<tr>
<th>Item 5. Nonwoven</th>
<th>Learning time: 5h</th>
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<tr>
<td><strong>Description:</strong> Major acquisition systems Properties of Nonwovens for product design, main applications <strong>Specific objectives:</strong> Learn the fundamentals of the technology of obtaining the nonwoven and its main applications.</td>
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<tr>
<th>Item 6. Finishing from the perspective of design</th>
<th>Learning time: 10h</th>
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<tbody>
<tr>
<td><strong>Description:</strong> Finishing processes for the production of textile materials applied to product design Bleaching and dyeing processes Sizing and finishing processes <strong>Related activities:</strong> P7. Prototyping from the end product specifications <strong>Specific objectives:</strong> Learn the basics of the main finishing processes and its possibilities from the perspective of product design.</td>
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<tr>
<th>7. Clothing Industry</th>
<th>Learning time: 16h</th>
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<tr>
<td><strong>Description:</strong> The garment design process. Pattern and marked Cutting, sewing and ironing <strong>Related activities:</strong> P8. Workshop CAD design pattern P9. Evaluation tissue properties <strong>Specific objectives:</strong> Learn the principles of pattern and design as well as industrial processes of cutting, sewing and ironing.</td>
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Item 8. Technical textiles

Description:
- Geotextiles
- Textile medicine
- Textile sport
- Textiles for the automotive and other transport
- Other applications of textiles

Related activities:
P10. Visit a textile industry

Specific objectives:
Know the main applications of textiles for technical use.

Learning time: 18h
- Theory classes: 4h
- Laboratory classes: 2h
- Self study: 12h

Qualification system

First exam: 25%
Second exam: 25%
Practice workshop or laboratory: 5%
Work on labeling: 5%
Work on textile fibers: 20%
Work on technical fabrics: 20%
Bibliography

Basic:


Complementary:


