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>20.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours small group: 30h</td>
<td>20.00%</td>
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<tr>
<td></td>
<td>Self study: 90h</td>
<td>60.00%</td>
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</tbody>
</table>
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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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</thead>
<tbody>
<tr>
<td><strong>Description:</strong> Structure of the textile industry</td>
<td>Theory classes: 2h</td>
</tr>
<tr>
<td>Socioeconomic importance</td>
<td>Self study: 3h</td>
</tr>
<tr>
<td>Uses of textiles</td>
<td></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><strong>Specific objectives:</strong></td>
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<tr>
<td>Know and understand the structure of the textile cycle, its socio-economic 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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<table>
<thead>
<tr>
<th>Item 2. Textile fibers and their possibilities in product design</th>
<th>Learning time: 40h</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong> Classification of textile fibers, abbreviations</td>
<td>Theory classes: 6h</td>
</tr>
<tr>
<td>Natural fibers of plant, animal and minerals</td>
<td>Laboratory classes: 4h</td>
</tr>
<tr>
<td>Man made fibers</td>
<td>Self study: 30h</td>
</tr>
<tr>
<td>Main physical properties that influence the design</td>
<td></td>
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<tr>
<td>Major chemical properties that influence the design</td>
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<tr>
<td>Textile Labelling</td>
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<tr>
<td><strong>Related activities:</strong></td>
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<tr>
<td>P1. Identification microscopy and organoleptic textile fibers</td>
<td></td>
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<tr>
<td>P2. Marches analytical identification of textile fibers</td>
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<tr>
<td><strong>Specific objectives:</strong></td>
<td></td>
</tr>
<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>
<td></td>
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</tbody>
</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.
**Item 5. Nonwoven**

**Description:**
- Major acquisition systems
- Properties of Nonwovens for product design, main applications

**Specific objectives:**
- Learn the fundamentals of the technology of obtaining the nonwoven and its main applications.

<table>
<thead>
<tr>
<th>Learning time: 5h</th>
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<tr>
<td>Theory classes: 2h</td>
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<tr>
<td>Self study: 3h</td>
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</table>

**Item 6. Finishing from the perspective of design**

**Description:**
- Finishing processes for the production of textile materials applied to product design
- Bleaching and dyeing processes
- Sizing and finishing processes

**Related activities:**
- P7. Prototyping from the end product specifications

**Specific objectives:**
- Learn the basics of the main finishing processes and its possibilities from the perspective of product design.

<table>
<thead>
<tr>
<th>Learning time: 10h</th>
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<tbody>
<tr>
<td>Theory classes: 2h</td>
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<tr>
<td>Laboratory classes: 2h</td>
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<tr>
<td>Self study: 6h</td>
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**7. Clothing Industry**

**Description:**
- The garment design process. Pattern and marked
- Cutting, sewing and ironing

**Related activities:**
- P8. Workshop CAD design pattern
- P9. Evaluation tissue properties

**Specific objectives:**
- Learn the principles of pattern and design as well as industrial processes of cutting, sewing and ironing.

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<thead>
<tr>
<th>Learning time: 16h</th>
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<tbody>
<tr>
<td>Theory classes: 2h</td>
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<tr>
<td>Laboratory classes: 6h</td>
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<td>Self study: 8h</td>
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**Item 8. Technical textiles**

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

**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.

**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:


