320084 - DIPT - Integral Development of Textile Products

Coordinating unit: 205 - ESEIAAT - Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 702 - CMEM - Department of Materials Science and Metallurgy
Academic year: 2018
Degree: BACHELOR'S DEGREE IN TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009).
(Teaching unit Compulsory)
ECTS credits: 6  Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: Ventura Casellas, Heura
Others: Cano Casas, Francesc
         Ardanuy Raso, Monica

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

Degree competences to which the subject contributes

Transversal:
1. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.
2. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.
3. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.

Teaching methodology

- Presential sessions for the exposure of results. Student involvement.
- Presential sessions of practical work.
- Self-directed study and preparation of deliverables.
- Preparation and development of assessable group activities.

Learning objectives of the subject

GLO1. To acquire the foundations and techniques for the textile design of yarns, fabrics, garments, household textiles and technical fabrics.
GLO2. To develop the ability to use the previous techniques to solve practical problems by combining a designer's creativity and an engineer's scientific rigour.
GLO3. To develop the specific and transversal skills associated to the academic work.
### Study load

<table>
<thead>
<tr>
<th></th>
<th>Total learning time: 150h</th>
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<tbody>
<tr>
<td>Hours large group:</td>
<td>15h 10.00%</td>
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<tr>
<td>Hours medium group:</td>
<td>45h 30.00%</td>
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<tr>
<td>Hours small group:</td>
<td>0h 0.00%</td>
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<tr>
<td>Guided activities:</td>
<td>0h 0.00%</td>
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<tr>
<td>Self study:</td>
<td>90h 60.00%</td>
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</tbody>
</table>
### Content

<table>
<thead>
<tr>
<th>Topic 1: FUNDAMENTALS OF TEXTILE PRODUCTS DESIGN</th>
<th>Learning time: 35h</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Theory classes: 10h</td>
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<tr>
<td>1.1. Basics concepts of textile product design.</td>
<td>Laboratory classes: 5h</td>
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<tr>
<td>1.2. Specifications analysis in textile products.</td>
<td>Self study: 20h</td>
</tr>
<tr>
<td>1.3. Fibre and yarn selection criteria for projecting the main fabric types.</td>
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<tr>
<td>1.4. Design stages for a fashion good.</td>
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<tr>
<td>1.4.1. Basic design and fashion item.</td>
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<td>1.4.2. Inspiration sources and trends.</td>
<td></td>
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<tr>
<td>1.4.3. Preparation sequence for a collection.</td>
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<tr>
<td>1.5. Use of design fundamentals to develop an integral project for a specific item.</td>
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**Specific objectives:**
- SO1. To understand the foundations of textile design and fashion through practical cases.
- SO2. To learn the use of textile designer's tools.

<table>
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<tr>
<th>Topic 2: PROJECTION OF FANCY AND SPECIAL EFFECTS YARNS</th>
<th>Learning time: 40h</th>
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<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Theory classes: 10h</td>
</tr>
<tr>
<td>2.1. Fancy effects obtained in the spinning process.</td>
<td>Laboratory classes: 5h</td>
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<tr>
<td>2.2. Production of the main types of fancy yarns with twisters and special machines.</td>
<td>Self study: 25h</td>
</tr>
<tr>
<td>2.3. Conceptual and formal considerations of yarns produced by non-conventional spinning systems.</td>
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<tr>
<td>2.4. Design of various types of special yarns for technical fabrics and non-textile uses.</td>
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<tr>
<td>2.5. Design of a specific yarn to be used in the integral project.</td>
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</tbody>
</table>

**Specific objectives:**
- SO3. To acquire knowledge of fancy yarns and the calculations involved in their industrial production.
- SO4. To be able to develop new yarns.
Continuous assessment is followed in order to balance self-directed learning and teamwork. Final mark will be the weighted average of the deliverables:

\[ NF = 0.30 \text{ Practicum} + 0.60 \text{ Project} + 0.10 \text{ Oral presentation} \]

- Practicum: tasks (exercises, study cases); laboratory practices
- Project: Course project, which consists of three parts corresponding to spinning, weaving and finishing.
- Oral presentation: Oral presentation of the course project.

### Topic 3: COMPUTER AIDED DESIGN OF WOVEN FABRICS

**Description:**
- 3.1. Fundamental concepts and stages for development of collections of fabrics.
- 3.2. Fundamental criteria for the computer assisted projection of yarns and fabrics.
- 3.3. Description of the textile CAD tools.
- 3.4. Capabilities and limitations of CAD tools.
- 3.5. Practical computer-assisted development of a collection of fabrics.
- 3.6. Use of CAD for the integral design project.

**Specific objectives:**
- SO5. To know the state of the art in the computer assisted simulation of fabrics.
- SO6. To use the knowledge acquired about fabric theory for industrial design and the production of the prototype developed in class.
- SO7. To understand the relationship between design, industrial production and their costs.

### Topic 4: PROJECTION OF COLOURS FOR DYEING AND PRINTING. DESIGN OF FINISHES AND FINISHING EFFECTS

**Description:**
- 4.1. Design of colouring effects in mixtures of fibres, yarns and fabrics obtained by sustainable dyeing processes.
- 4.2. Fashion effects by printing processes with a low environmental impact.
- 4.3. Incorporation of products of finishes and finishing processes with a high value-added.
- 4.4. Critical analysis of the whole production process for a textile product.
- 4.5. Perspective axes for the design of new textiles with enhanced functionalities.

**Specific objectives:**
- SO8. To relate the knowledge acquired about materials, yarns and fabrics to their colouration, dyeing and finishing potential.
- SO9. To understand the value-added provided by chemical processes in the integral development of garment, household and technical fabrics.
Regulations for carrying out activities

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

Bibliography

Basic: