320079 - DELM - Design of Laminar Mesh Structures

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 TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009).
(Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: Xavier Capdevila Juan

Prior skills
A prior sound knowledge of graphical expression, materials and applied mechanics principles is required.

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. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

Teaching methodology

The course is divided into two parts corresponding to the tecnologies weft knitting and warp knitting; in each part follows the same approach: structure (types and effects of knitting fabric) machine (mechanisms and parameters of the knitting and weaving) and production (calculations). Face sessions to explain the above approach with industrial vision, small-group discussion of problems and questions under teachers’ supervision in presentational activity sessions.

Learning objectives of the subject

· To acquire a basic knowledge of the different types of structures present in textiles products and their industrial uses.
· To be able to use the acquired knowledge to design new textile structures.
· To master the representation of knitted fabrics as a bridge between weaving and textile structure design.
· To become acquainted with available weaving techniques in order to understand their potential and limitations as regards knitted structure production, as well as structure alteration mechanisms.
## Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group: 30h 20.00%</th>
<th>Hours medium group: 0h 0.00%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Hours small group: 30h 20.00%</td>
<td>Guided activities: 0h 0.00%</td>
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<td>Self study: 90h 60.00%</td>
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</tbody>
</table>
## Content

### PART 1: WEFT KNITTING STRUCTURES

**Degree competences to which the content contributes:**

<table>
<thead>
<tr>
<th>Topic 1: STRUCTURE</th>
<th>Learning time: 25h</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 5h</td>
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<tr>
<td></td>
<td>Laboratory classes: 5h</td>
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<tr>
<td></td>
<td>Self study: 15h</td>
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</table>

**Description:**
1.1 Structural characteristics and parameters.
1.2 Weft knitted fabric geometry.
1.3 Basics structures of weft knits.
1.4 Loop formation sequence: the basic knitting action of the leedle machine.

**Specific objectives:**
- Characterize the knitting structure
- Represent the knitting structure.
- Understand the working cycle of the needle.

<table>
<thead>
<tr>
<th>Topic 2: TECHNOLOGY</th>
<th>Learning time: 25h</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 5h</td>
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<tr>
<td></td>
<td>Laboratory classes: 5h</td>
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<tr>
<td></td>
<td>Self study: 15h</td>
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</tbody>
</table>

**Description:**
2.1 Characteristics of knitting machines.
2.2 Knitting elements and production calculations.
2.3 Weaving potential of each type of knitting machine.

**Specific objectives:**
- Know the parts and parameters of knitting machines.
- Know how to prepare the knitting machine for knitting of different structures.
- Know the different commercial structures that can manufactures in different knitting machines.
### PART 2: WARP KNITTING STRUCTURES

#### Degree competences to which the content contributes:

<table>
<thead>
<tr>
<th>Degree competences</th>
<th>Learning time</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 Structural effects.</td>
<td>25h</td>
</tr>
<tr>
<td>3.2 Colour effects.</td>
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<tr>
<td>3.3 Shape effects.</td>
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</tbody>
</table>

#### Specific objectives:
- Know the mechanisms to modify the structures.
- Know the effects that can be introduced into the structures to increase their commercial values.
- Know represents these effects.

#### Topic 4: STRUCTURE

<table>
<thead>
<tr>
<th>Learning time</th>
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<tbody>
<tr>
<td>Theory classes: 5h</td>
</tr>
<tr>
<td>Laboratory classes: 5h</td>
</tr>
<tr>
<td>Self study : 15h</td>
</tr>
</tbody>
</table>

#### Description:
- 4.1 Structural characteristics and parameters.
- 4.2 Warp knitted fabric geometry.
- 4.3 Basics structures of warp knits.
- 4.4 Loop formation sequence: the basic knitting action of the needle machine.

#### Specific objectives:
- Characterize the structures.
- Represent the structures.
- Understand the process of formation of stitches.
### Topic 5: TECHNOLOGY

**Learning time:** 25h
- Theory classes: 5h
- Laboratory classes: 5h
- Self study: 15h

**Description:**
- 5.1 Characteristics of machines.
- 5.2 Knitting elements and production calculations.
- 5.3 Weaving potential of each loom type.

**Specific objectives:**
- Know the parts and parameters of knitting machines.
- Know how to prepare the knitting machine for knitting different structures.
- Know the different commercial structures that can be manufactured in different knitting machines.

### Topic 6: STRUCTURE DESIGNS

**Learning time:** 25h
- Theory classes: 5h
- Laboratory classes: 5h
- Self study: 15h

**Description:**
- 6.1 Structural effects.
- 6.2 Colour effects.
- 6.3 Technical structures.

**Specific objectives:**
- Know the mechanisms to modify the structures.
- Know the effects that can be introduced into the structures to increase their commercial values.
- Know represents these effects

### Qualification system

- First examination: 45%
- Second examination: 45%
- Related activities: 10%

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. The renewal of the first test for suspensions by means of a test added on the final exam: maximum possible markable score 7. The resulting qualification will not be less than obtained by maintaining the original qualification of the first evaluation.
Bibliography

**Basic:**


**Complementary:**
