320080 - DELC - Design of Laminar Net 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: 2019
Degree: BACHELOR'S DEGREE IN TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 6  Teaching languages: Catalan

Coordinator: Mónica Ardanuy

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

Degree competences to which the subject contributes
Specific:
1. TEX: A background of woven structures

Teaching methodology
Sessions of theory
Sessions of practical work at class
Sessions of practical work at laboratory

Learning objectives of the subject
GLO1. To know the weaving technologies and processes.
GLO. To know all representation and structuring processes for woven fabrics and the effects of their combinations on fabric appearance.
GLO3. To be able to select the most appropriate process in terms of the fabric to be produced and its purpose, as well as the technical and economic requirements involved.
GLO4. To be able to design, manufacture and purchase any type of fabric.

Study load

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

## Topic 1: CHARACTERIZATION OF FABRICS

**Learning time:** 20h  
Theory classes: 4h  
Laboratory classes: 4h  
Self study: 12h

### Description:
1.1. Structural parameters of fabrics.  
1.2. Fabric representation. Names and symbols.  
1.3. Major classifications of fabrics according to use.  
1.4. Technical vocabulary.

### Related activities:
1,2

### Specific objectives:
OE1. To know how to make a basic characterization of a woven fabric  
OE2. To know the basic vocabulary related with the design of woven fabrics

## Topic 2: DESIGN OF BASIC STRUCTURES

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

### Description:
1.5. Study of basic structures and their derivatives.  
1.6. Requirements of their production processes.  
1.7. Analysis of basic weaves.

### Related activities:
1,3

### Specific objectives:
SO3. To become acquainted with the simple weaves used in fabric design, as well as with the technical and production requirements involved.
**Topic 3: COMPLEX STRUCTURES**

**Learning time:** 40h  
Theory classes: 8h  
Laboratory classes: 8h  
Self study: 24h

**Description:**  
1.8. Two-sided and multiple fabrics.  
1.9. Long yarn float in fabrics.  
1.10. Double-layers and multiple layers fabrics.  
1.11. Leno weave.  
1.12. Narrow fabrics.  
1.13. Terry fabrics.  
1.15. Circular weaves.  
1.16. 2D and 3D fabrics.

**Related activities:**  
1, 3

**Specific objectives:**  
SO4. To become acquainted with the complex weaves used in fabric design, as well as with the technical and production requirements involved.  
SO5. To know how to choose the machinery to produce woven structures in function of the product to produce.

**Topic 4: DESCRIPTION OF PREPARATION SYSTEMS**

**Learning time:** 20h  
Theory classes: 4h  
Laboratory classes: 4h  
Self study: 12h

**Description:**  
1.18. Production and quality management.  

**Related activities:**  
1, 2, 3

**Specific objectives:**  
OE6. To know how to choose the preparation system in function of the fabric to produce.
<table>
<thead>
<tr>
<th><strong>Topic 5:</strong> ANALYSIS OF THE WEAVING MACHINE PERFORMANCE IN TERMS OF THE DESIGN TO BE PRODUCED</th>
<th><strong>Learning time:</strong> 30h</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Theory classes: 6h</td>
</tr>
<tr>
<td>1.20. Specificities of machines as a function of the target article.</td>
<td>Laboratory classes: 6h</td>
</tr>
<tr>
<td>1.21. Fabric design and the reed of the weaving machine. Faults.</td>
<td>Self study: 18h</td>
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<tr>
<td>1.22. Importance of drawing-in-draft.</td>
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<td>1.23. Density regulators.</td>
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<td>1.24. Warp stress control.</td>
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<td>1.25. Double beams.</td>
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<td>1.27. Weaving triangle and evolution of looms.</td>
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<tr>
<td><strong>Related activities:</strong></td>
<td></td>
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<tr>
<td>1,2,3</td>
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<tr>
<td><strong>Specific objectives:</strong></td>
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<tr>
<td>OE7. To know the operation of weaving machines to prevent and correct complications during the design process.</td>
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<thead>
<tr>
<th><strong>Topic 6:</strong> SELECTION CRITERIA FOR WEAVING SYSTEMS</th>
<th><strong>Learning time:</strong> 15h</th>
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<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Theory classes: 3h</td>
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<tr>
<td>1.28. Approaching the target product as a function of the particular machine.</td>
<td>Laboratory classes: 3h</td>
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<td>1.29. Trends in weaving machinery.</td>
<td>Self study: 9h</td>
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<td>1.30. Factors influencing the choice of a weaving system.</td>
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<td><strong>Related activities:</strong></td>
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<tr>
<td>1,2,3</td>
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<tr>
<td><strong>Specific objectives:</strong></td>
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<td>OE8. To know how to choose the best system to weave in function of the design.</td>
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Qualification system

Exams: 60% (30% 1st, 30% 2nd)
Laboratory: 15%
Other deliverables: 25%
Recovery mechanism: The unsatisfactory results of the first partial exam can be redirected by means of a written test to be carried out on the day set for the final exam. This test can be accessed by all students with a mark less than 5.0 of the assessment act, with a score of between 0 or 10. The mark obtained by the application of the conversion will replace the initial qualification as long as it is higher.

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.

Bibliography

Basic:

Complementary: