310027 - Construction V

Coordinating unit: 310 - EPSEB - Barcelona School of Building Construction
Teaching unit: 753 - TA - Department of Architectural Technology
Academic year: 2017
Degree: BACHELOR'S DEGREE IN ARCHITECTURAL TECHNOLOGY AND BUILDING CONSTRUCTION (Syllabus 2015). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN BUILDING CONSTRUCTION SCIENCE AND TECHNOLOGY (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 4 Teaching languages: Catalan

Teaching staff
Coordinator: BOSCH PRAT, MIREIA
Others: Bosch Prat, Mireia
Olona Casas, Joan

Opening hours
Timetable: PROFESSOR MIREIA BOSCH PRAT: WEDNESDAYS FROM 12 TO 14 HOURS.

Prior skills
Graphic expression.
Written expression.
Oral expression.

Requirements
It is very recommendable to have passed the subjects of Construcció I-II-III-IV.

Degree competences to which the subject contributes

Specific:
1. FE-4 Knowledge of the materials and traditional or prefabricated construction systems used in construction, their varieties and physical and mechanical features which define them.
2. FE-7 Ability to identify the constructive elements and systems, define its function and compatibility, and its implementation to construction in the construction process. Plan and solve constructive details.

Transversal:
3. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.
4. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 2. Using strategies for preparing and giving oral presentations. Writing texts and documents whose content is coherent, well structured and free of spelling and grammatical errors.
5. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.
6. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.
7. SELF-DIRECTED LEARNING - Level 2: Completing set tasks based on the guidelines set by lecturers. Devoting the time needed to complete each task, including personal contributions and expanding on the recommended information sources.
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Teaching methodology

Methodology based on a learning focused on the student (the active involvement of the student in all the process implicates a development of the self-learning and self-evaluation abilities of reasoning):

The learning of modules of objectives. The purpose of this method is to make easier to the student the global comprehension of the different knowledges which are in some way related between them and which form the course list of topics.

The learning based in problems (ABP), in this case the student sets out a problem which for its resolution it is necessary to acquire all the required competences and knowledge.

The directed learning hours consist on the one hand in teaching theoretical classes (big group) where the professor does a brief exposition to introduce the general learning objectives related with the basic concepts of the subject. Subsequently and by means of practical exercises, the professor motivates and involves the students so that they can participate actively in their own learning. It is used support material in detailed teaching plan by ATENEA: learning objectives by contents, concepts, examples, evaluation activities and directed learning schedules and bibliography.

On the other hand, the directed learning hours also consist on teaching practical classes (medium group) where the students generally work in work groups of 3 members, by the resolution of exercises related with the specific learning objectives of each one of the contents of the subject.

Most of these practical sessions incorporate generic competences. Therefore cooperative learning techniques are developed at class.

Generally, after each theory session out of class tasks are proposed, which must be worked individually or in groups.

This teaching methodology is planned for a maximum of 50-55 students.

Learning objectives of the subject

The general objective of the subject is to identify, classify and choose the suitability of the different construction components which form the distribution and connection systems inside a building as well as the veneers of the finish.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 100h</th>
<th>Hours large group:</th>
<th>24h</th>
<th>24.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>10h</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Guided activities:</td>
<td>6h</td>
<td>6.00%</td>
</tr>
<tr>
<td></td>
<td>Self study:</td>
<td>60h</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
# 310027 - Construction V

## Content

<table>
<thead>
<tr>
<th>INTRODUCTION. PRINCIPLES OF THE DISTRIBUTION AND FINISHING SYSTEMS</th>
<th>Learning time: 3h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Theory classes: 2h</td>
</tr>
<tr>
<td>In the module I the students work:</td>
<td>Laboratory classes: 0h</td>
</tr>
<tr>
<td>Previous concepts of the different vertical components systems of the stairs, ramps, pavements and veneers in ceilings and surfaces.</td>
<td>Guided activities: 1h</td>
</tr>
<tr>
<td>Specific objectives:</td>
<td></td>
</tr>
<tr>
<td>1. Understand and classify subsystems of enclosures.</td>
<td></td>
</tr>
<tr>
<td>2. Understand and classify subsystems of veneers.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit I. THE DISTRIBUTION FUNCTION: VERTICAL ELEMENTS WORKABLE AND NON WORKABLES</th>
<th>Learning time: 43h 10m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td>Theory classes: 12h</td>
</tr>
<tr>
<td>In the Module I the students work:</td>
<td>Laboratory classes: 0h</td>
</tr>
<tr>
<td>The concept of distribution in stores, rooms or ambients which must accomplish a necessity plan previously defined, with the objective of not only divide into zones but also the protection against thermal, acoustic and fire effects and habitability concepts which are used to determine the construction solutions to do.</td>
<td>Guided activities: 4h 10m</td>
</tr>
<tr>
<td>Related activities:</td>
<td>Self study : 27h</td>
</tr>
<tr>
<td>In the module II there will be done these activities:</td>
<td></td>
</tr>
<tr>
<td>Activity 1 (A1).</td>
<td></td>
</tr>
<tr>
<td>Activity 2 (A2).</td>
<td></td>
</tr>
<tr>
<td>Activity 3 (A3).</td>
<td></td>
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<tr>
<td>Activity 4 (A4).</td>
<td></td>
</tr>
<tr>
<td>Specific objectives:</td>
<td></td>
</tr>
<tr>
<td>1. Understand and apply the output requirements of the practicable vertical components.</td>
<td></td>
</tr>
<tr>
<td>2. Understand and apply the output requirements of the non-practicable vertical components.</td>
<td></td>
</tr>
<tr>
<td>3. Justify and apply the constructive and functional typologies in practicable vertical components.</td>
<td></td>
</tr>
<tr>
<td>4. Justify and apply the constructive and functional typologies in non-practicale vertical components.</td>
<td></td>
</tr>
<tr>
<td>5. Choose the suitability between the different constructive and functional typologies, both in practicable and non-practicable vertical components.</td>
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</tbody>
</table>
### Unit II. THE COMUNICATION FUNCTION: STAIRS AND RAMPS

<table>
<thead>
<tr>
<th>Learning time: 15h 40m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory classes: 4h</td>
</tr>
<tr>
<td>Laboratory classes: 0h</td>
</tr>
<tr>
<td>Guided activities: 5h 40m</td>
</tr>
<tr>
<td>Self study: 6h</td>
</tr>
</tbody>
</table>

**Description:**
In the Module II the students work:
The concept of vertical connection by means of fixed construction components like stairs and ramps. In both cases it is overcome a slope which always must be comfortable, safe and fast, and with these parameters the constructive solutions will be determined, assuming the concept of evacuation and the current application regulations.

**Related activities:**
In the Module II there will be done this activity:
Activity 5 (A5).
Activity 6 (A6).

**Specific objectives:**
1. Understand and apply the output requirements of the stairs.
2. Understand and apply the output requirements of the ramps.
3. Justify and apply the constructive and functional typologies of the stairs.
4. Justify and apply the constructive and functional typologies of the ramps.
5. Choose the suitability between the different constructive and functional typologies of the stairs and the ramps.
# Unit III. CONTINUOUS AND DISCONTINUOUS LINING OF HANGING WALLS, VERTICAL, HORIZONTAL AND ROOFS

<table>
<thead>
<tr>
<th>Learning time: 43h 10m</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Theory classes:</strong> 12h</td>
</tr>
<tr>
<td><strong>Laboratory classes:</strong> 0h</td>
</tr>
<tr>
<td><strong>Guided activities:</strong> 4h 10m</td>
</tr>
<tr>
<td><strong>Self study:</strong> 27h</td>
</tr>
</tbody>
</table>

## Description:
In the Module III the students work:
The classification of the enclosures in three big groups: horizontal enclosures, vertical enclosures and ceilings. The three receive attacks belonging to their uses. The three groups must provide a light, acoustic, thermal and functional ambient which requires a formal, texture and and pictorial aspect which will determine the constructive solutions to do.

## Related activities:
In this Module there will be done these activities:
- Activity 7 (A7).
- Activity 8 (A8).

## Specific objectives:
1. Understand and apply the output requirements of the pavement coverings.
2. Understand and apply the output requirements of the wall veneers.
3. Understand and apply the output requirements of the ceiling veneers.
4. Justify and apply the constructive and functional typologies of the veneers in pavements, walls and ceilings.
5. Choose the suitability between the different functional typologies of the veneers in pavements, walls and ceilings.
### Planning of activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Support materials</th>
<th>Specific objectives</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A.1 EDUCATIONAL ACTIVITY OF CONTINUOUS EVALUATION ON LINE. UNIT I</strong></td>
<td>By means of ATENEA there will be done a self-evaluation questionnaire of the contents of the Module I, being an educational activity, not summative. Individually, the student will do a knowledge questionnaire of the Module by ATENEA, which will cover all the specific learning objectives. This self-evaluation questionnaire provides an orientation of the level of knowledge of the student regarding the Module.</td>
<td>Basic and specific bibliography. Notes of the topic available (PowerPoint) in ATENEA. Wording and/or questionnaire of the exercise. Following official resolution with correction criteria (rúbrica).</td>
<td>1. Understand and apply the output requirements of the practicable vertical components. 2. Understand and apply the output requirements of the non-practicable vertical components. 3. Justify and apply the constructive and functional typologies in practicable vertical components. 4. Justify and apply the constructive and functional typologies in non-practicale vertical components. 5. Choose the suitability between the different constructive and functional typologies, both in practicable and non-practicable vertical components.</td>
<td><strong>8h</strong> Theory classes: 3h Laboratory classes: 1h Self study: 4h</td>
</tr>
<tr>
<td><strong>A.3 INDIVIDUAL TEST OF CONTINUOUS EVALUATION. UNIT I.</strong></td>
<td>Individually, the student will do a knowledge exam of the Module I, which will cover all the specific learning objectives of the Module, by means of graphic and written expression. Correction by the faculty.</td>
<td>Basic and specific bibliography. Notes of the topic available (PowerPoint) in ATENEA. Wording and/or questionnaire of the exercise. Following official resolution with correction criteria (rúbrica).</td>
<td></td>
<td><strong>5h</strong> Self study: 5h</td>
</tr>
</tbody>
</table>

**Support materials:**
- Basic and specific bibliography.
- Notes of the topic available (PowerPoint) in ATENEA.
- Wording and/or questionnaire of the exercise.
- Following official resolution with correction criteria (rúbrica).
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**Specific objectives:**
1. Understand and apply the output requirements of the practicable vertical components.
2. Understand and apply the output requirements of the non-practicable vertical components.
3. Justify and apply the constructive and functional typologies in practicable vertical components.
4. Justify and apply the constructive and functional typologies in non-practicable vertical components.
5. Choose the suitability between the different constructive and functional typologies, both in practicable and non-practicable vertical components.

**Hours:** 12h
- Theory classes: 2h
- Self study: 8h
- Guided activities: 2h

**A.2 ANALYSIS AND FUNCTIONAL RESOLUTION AND CONSTRUCTIVE, ACCORDING TO THE REGULATIONS OF THE ACTIONS ACOUSTIC, THERMIC AND HABITABILITY OF A BUILDING.COMPETENCES UPC2/ UPC4/ UPC5/ UPC6/ UPC7**

**Description:**
Practical work which has to be done in groups of three members.
By means of the directed learning the students will do a previous reading of the guide notes and will answer the corresponding questionnaire.
Activity which represents the 20% of the final mark of the subject.

**Support materials:**
- Detailed guide notes with the questionnaire of the work.
- Specific bibliography.

**Descriptions of the assignments due and their relation to the assessment:**
Registration by the professor of the work delivery.
The work will be returned corrected with the corresponding feedback of the professor.
It represents a part of the continuous evaluation 20%.
Delivery scheduled during the 7th week.

**Specific objectives:**
1. Understand and apply, according to thermal criteria, the output requirements of the practicable and non-practicable vertical components.
2. Justify and apply, according to thermal criteria, the constructive and functional typologies in practicable and non-practicable vertical components.
3. Choose the suitability, according thermal, acoustic, design and habitability criteria between the different constructive and functional typologies, both in practicable and non-practicable vertical components.

**A.5 EDUCATIONAL ACTIVITY OF CONTINUOUS EVALUATION ON LINE. UNIT II (NON FACE-TO-FACE)**

**Hours:** 4h
- Theory classes: 0h
- Practical classes: 0h
- Laboratory classes: 0h
- Guided activities: 2h
- Self study: 2h
### A.6 RESEARCH OF CONSTRUCTIVE SOLUTIONS FOR LINING AND PAVEMENT. ANALYSIS, FUNCTIONAL RESOLUTION, CONSTRUCTIVE AND CONTROL OF QUALITY. COMPETENCES UPC2/ UPC4/ UPC5/ UPC6/ UPC7

**Description:**
By means of ATENEA there will be done a self-evaluation questionnaire of the contents of the Module II. Individually, the student will do a knowledge questionnaire of the Module by ATENEA, which will cover all the specific learning objectives. This self-evaluation questionnaire provides an orientation of the level of knowledge of the student regarding the Module.

**Support materials:**
- Basic and specific bibliography.
- Notes of the topic available (PowerPoint) in ATENEA.
- Wording and/or questionnaire of the exercise.
- Following official resolution with correction criteria (rúbrica).

**Descriptions of the assignments due and their relation to the assessment:**
- Activity planned outside the usual schedule of the subject.
- Delivery by Atenea during the 11th week of the course.
- Educational activity which does represent 5 % of the final mark of the subject.

**Specific objectives:**
1. Understand and apply the output requirements of the pavement coverings.
2. Understand and apply the output requirements of the wall veneers.
3. Understand and apply the output requirements of the ceiling veneers.
4. Justify and apply the constructive and functional typologies of the veneers in pavements, walls and ceilings.
5. Choose the suitability between the different functional typologies of the veneers in pavements, walls and ceilings.

<table>
<thead>
<tr>
<th>Hours</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>10h</td>
<td>Theory classes: 2h</td>
</tr>
<tr>
<td></td>
<td>Practical classes: 0h</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 2h</td>
</tr>
<tr>
<td></td>
<td>Self study: 5h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 1h</td>
</tr>
</tbody>
</table>

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### Description:
Practical work in groups of three members. The professor will designate a constructive solution for each group and the students must define by construction details and the execution process.

**Support materials:**
- Basic and specific bibliography.
- Notes of the topic available (PowerPoint) in ATENEA.
- Wording and/or questionnaire of the exercise.
- Following official resolution with correction criteria (rúbrica).

**Descriptions of the assignments due and their relation to the assessment:**
- Delivery by ATENEA during the 15th week.
- It represents a part of the continous evaluation, a 20%.

**Specific objectives:**
1. Understand and apply the output requirements of the veneers of pavements, walls and ceilings.
2. Justify and apply the constructive and functional typologies of the veneers in pavements, walls and ceilings.
### A.4 EVALUATION ACTIVITY IN GROUP. UNIT III. RESEARCH OF CONSTRUCTIVE SOLUTIONS IN THE VERTICAL COMMUNICATIONS OF THE INSIDE OF THE BUILDINGS

<table>
<thead>
<tr>
<th>Hours:</th>
<th>12h 20m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guided activities:</td>
<td>2h</td>
</tr>
<tr>
<td>Self study:</td>
<td>8h 20m</td>
</tr>
<tr>
<td>Theory classes:</td>
<td>2h</td>
</tr>
</tbody>
</table>

**Description:**
Practical work in groups of three members.
The professor will designate a constructive solution for each group and the students must define by construction details and the execution process.

**Support materials:**
- Basic and specific bibliography.
- Notes of the topic available (PowerPoint) in ATENEA.
- Wording and/or questionnaire of the exercise.
- Following official resolution with correction criteria (rúbrica).

**Descriptions of the assignments due and their relation to the assessment:**
- Delivery by ATENEA during the 11th week.
- It represents a part of the continuous evaluation, a 25%.

**Specific objectives:**
Interpret and apply the output demands of the regulations.

### A.7 EDUCATIONAL ACTIVITY OF INDIVIDUAL EVALUATION ON LINE. UNIT I

<table>
<thead>
<tr>
<th>Hours:</th>
<th>8h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory classes:</td>
<td>1h</td>
</tr>
<tr>
<td>Self study:</td>
<td>4h</td>
</tr>
<tr>
<td>Theory classes:</td>
<td>3h</td>
</tr>
</tbody>
</table>

**Description:**
By means of ATENEA there will be done a self-evaluation questionnaire of the contents of the Module III, being an educational activity, not summative.
Individually, the student will do a knowledge questionnaire of the Module by ATENEA, which will cover all the specific learning objectives.
This self-evaluation questionnaire provides an orientation of the level of knowledge of the student regarding the Module.

**Support materials:**
- Basic and specific bibliography.
- Notes of the topic available (PowerPoint) in ATENEA.
- Wording and/or questionnaire of the exercise.
- Following official resolution with correction criteria (rúbrica).

**Descriptions of the assignments due and their relation to the assessment:**
- Activity planned out of the usual schedule of the subject.
- Delivery by Atenea during the 15th week of the course.
- Educational activity which does represent 5% of the final mark of the subject.
Specific objectives:
1. Interpret and apply the performance requirements of vertical and horizontal lining.
2. To justify and apply the functional and constructive types of vertical and horizontal lining.
3. Choose the suitability between the different functional and constructive types, both in the vertical and practicable elements as in the vertical elements not practicable, in the set of linings.

Qualification system

The continuous evaluation consist on doing different activities, both individual and in groups, with summative and educational nature. These activities will be done during the course (in and out of class).
The Modules II, III and IV will be evaluated individually and the worth of the activities will be divided with this proportion:

Activity 1. 5% Week 7
Activity 2. 20% Week 7
Activity 3. 20% Week 8
Activity 4. 25% Week 11
Activity 5. 5% Week 11
Activity 6. 20% Week 15
Activity 7. 20% Week 15
Activity 8. 5% Week 15

Regulations for carrying out activities

It is compulsory for passing the subject the realization and presentation of all the activities.
Bibliography

Basic:


Complementary:


Others resources:

Normative:
Technical Code in Construction
SU Safety of use
DB HS Salubrity
DB HE Energy save
DB SI Security in case of fire
DB HR Noise protection

Decree 259/2003 of 21 October, about the minimum habitability requirements in housing buildings and the habitability certificate (DOGC no. 3999, 30 October of 2003)
Decree 135/1995 Accessibility code of Catalonia