210211 - AC AS - Architectural Acoustics. Room Acoustics

**Coordinating unit:** 210 - ETSAB - Barcelona School of Architecture  
**Teaching unit:** 753 - TA - Department of Architectural Technology  
**Academic year:** 2019  
**Degree:** DEGREE IN ARCHITECTURE (Syllabus 2010). (Teaching unit Optional)  
DEGREE IN ARCHITECTURE STUDIES (Syllabus 2014). (Teaching unit Optional)  
**ECTS credits:** 3  
**Teaching languages:** Catalan, Spanish

**Teaching staff**

**Coordinator:** AMAYA CABALLERO MARCOS  
**Others:** Primer quadrimestre: AMAYA CABALLERO MARCOS - 140

**Opening hours**

**Timetable:** Every day, during the period of development of the subject.

**Requirements**

Having passed Conditioning and Services I and II.

**Degree competences to which the subject contributes**

**Basic:**
- CB1. Translation from Spanish slope
- CB2. Translation from Spanish slope
- CB3. Translation from Spanish slope
- CB4. Translation from Spanish slope
- CB5. Translation from Spanish slope

**Specific:**
- EAB8. Translation from Spanish slope
- ET11. Translation from Spanish slope
- ET2. Translation from Spanish slope
- EP14. Translation from Spanish slope
- EP2. Translation from Spanish slope

**Transversal:**
- CT1. Translation from Spanish slope
- CT2. Translation from Spanish slope
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CT4. Translation from Spanish slope
CT5. Translation from Spanish slope
CT6. Translation from Spanish slope

Teaching methodology

Presental activities: 33 hours, dedicates to:
Introduction and theoretical sessions,
Master class,
Practicals sessions/ resolution of exercises and real problems/ workshops and seminars
Study cases/ visits to acoustic spaces,
Visits to acoustic laboratory
Exhibition spaces/ commercial houses
Team work

Activities without presence: 42 hours, dedicates to:
Autonom work, development of study case

Learning objectives of the subject

The student will be able to analyze, design and project the sound space based on its artistic, technical and scientific quality, from landscaping, urban planning and architecture to materialization in general and particularly in musical audition venues.

It will allow the student to acquire specific training in exterior and interior acoustics, from the sound landscape to the acoustics and electroacoustics of the equipment and audition venues and places of public attendance.

In particular, the student will be able to analyze the different phases of isolation to external and internal noises, impacts and vibrations, the existing acoustic theories for Auditoriums and Opera Rooms, and their specific calculation methods, with the exemplification of the designs made in these fields.

Specifically, the student will have knowledge that allows him / her to understand and realize the sound isolation to the architecture of equipment, from the planning, to the barriers and screens, the necessary acoustic conditioning treatments, and the objective and subjective parameters of room quality.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 75h</th>
<th>Hours large group: 33h</th>
<th>44.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self study: 42h</td>
<td>56.00%</td>
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</table>
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Content

<table>
<thead>
<tr>
<th>Acoustic architecture Room acoustics</th>
<th>Learning time: 75h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 33h</td>
</tr>
<tr>
<td></td>
<td>Self study: 42h</td>
</tr>
</tbody>
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Description:
A) Acoustic architecture
1. Reminder of basic concepts of sound communication in architecture.
2. The poetics and the sound landscape inside and outside. Acoustic architecture against noise.
3. Sound landscape, acoustic character and sound itineraries in cities and buildings.
B) Equipment acoustics
4. The acoustics and electroacoustics of enclosures.
5. Acoustic planning and isolation of equipment.
6. The isolation in the air sound, of impacts and vibrations.
7. Reverberation, reflection, absorption and diffusion.
8. Interior and exterior screenings.
9. Examples of equipment. Scheduled visit
C) Salas acoustics
10. The great hall, historical, architectural and acoustic process.
11. Wave, statistical, geometric and computer methods. Simulations
12. Subjective and objective parameters of sound quality.
13. Forms, proportions, finishing materials and textures.
15. Examples of auditorium, opera houses and special rooms. Scheduled visits

Practices
1. Sound itinerary in the city.
2. Acoustic inspection of an equipment.

Related activities:

Qualification system

<table>
<thead>
<tr>
<th>System</th>
<th>Continuous evaluation</th>
<th>Final evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual work ans exercises</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Team work and exercises</td>
<td>50%</td>
<td>50%</td>
</tr>
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</table>

Continuous evaluation
The continuous evaluation will be based on the work that the student will develop during the course, through the delivery of papers or the performance of written and/or oral tests, according to the criteria and calendar that are established.

Final evaluation
If the continuous evaluation is not positive, a second evaluation can be carried out, which will consist of a final global test in the format established according to the criteria of the responsible teacher (written or oral test and/or delivery of works).
Regulations for carrying out activities

Individual work: search work on urban acoustics, sound heritage and sound art, and / or equipment architecture.
Collective work: analysis or design of an acoustic, urban or equipment space, theater, auditorium or opera room, real or fictional.

Bibliography

Basic:


Complementary:


Others resources:

REAL DECRETO 1367/2007, de 19 de octubre, por el que se desarrolla la Ley 37/2003, de 17 de noviembre, del Ruido, en lo referente a zonificación acústica, objetivos de calidad y emisiones acústicas.

REAL DECRETO 1371/2007, de 19 de octubre, por el que se aprueba el documento básico «DB-HR Protección frente al ruido» del Código Técnico de la Edificación y se modifica el Real Decreto 314/2006, de 17 de marzo, por el que se aprueba el Código Técnico de la Edificación.

EASE. Manual de utilización del programa de simulación E.A.S.E
CattAcoustic, software de simulación acústica.