250665 - CONTACUST - Noise Pollution

Coordinating unit: 250 - ETSECCPB - Barcelona School of Civil Engineering
Teaching unit: 739 - TSC - Department of Signal Theory and Communications
Academic year: 2015
Degree: MASTER'S DEGREE IN ENVIRONMENTAL ENGINEERING (Syllabus 2014). (Teaching unit Optional)
ECTS credits: 5  Teaching languages: Catalan, Spanish, English

Teaching staff
Coordinator: JORDI ROMEU GARBI
Others: JORDI ROMEU GARBI

Opening hours
Timetable: Hours to be arranged by email or class

Teaching methodology
The methodology is based on the combination of several activities
- Classroom lectures on theoretical concepts that are related to the course. Related problems are also solved.
- A set of individual problems are proposed as a homework.
- Experimental noise impact assessment activity is individually carried out also as a homework
- Calculation of acoustic impact of infrastructure by simulation. Work group within the classroom sessions and as homework.

Learning objectives of the subject
CE01 - Apply scientific concepts to environmental problems and their correlation with technological concepts. CE08-Dimension unconventional systems and advanced treatment and raise their mass balance and energy.
Explore scientific concepts and technical principles of quality management of the receiving means, atmosphere, water and soil, and applied to problem solving.
Explore scientific concepts and technical principles of management and treatment of gaseous emissions, water supply, sewage and waste and remediation techniques for groundwater and contaminated soils.
Sized systems for the treatment of major pollutants vectors in specific sectors of activity.
Interprets rules, identifies goals, assesses technical alternatives proposed unconventional solutions and priority actions.
Definition of the characteristic parameters of sound and its perception.
Sound propagation in free field. Sound power. Corrections to the theoretical propagation.
Reflection and sound absorbing materials. Acoustic behavior of a room.
Sound measurements. Using sound level meter and analyzer. Good practice in sampling.
Noise impact study. Input data, assumptions and deliverables. Calculation methods and simulation models. Study applied the existing legal framework.
The goal of the course is that the student is able to make the study of acoustic assessment of existing or future activity.

<table>
<thead>
<tr>
<th>Study load</th>
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<tbody>
<tr>
<td><strong>Total learning time:</strong></td>
<td>125h</td>
<td></td>
</tr>
<tr>
<td>Theory classes:</td>
<td>15h</td>
<td>12.00%</td>
</tr>
<tr>
<td>Practical classes:</td>
<td>10h</td>
<td>8.00%</td>
</tr>
<tr>
<td>Laboratory classes:</td>
<td>10h</td>
<td>8.00%</td>
</tr>
<tr>
<td>Guided activities:</td>
<td>10h</td>
<td>8.00%</td>
</tr>
<tr>
<td>Self study:</td>
<td>80h</td>
<td>64.00%</td>
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## Noise measurement

**Description:**
Presentation of theoretical concepts relating to the measurement of noise  
Solving problems related to noise measurement

**Specific objectives:**
Understand the theoretical principles governing noise measurement  
Application of theoretical concepts of measurement noise, Strengthen the theory governing the measurement of noise.

<table>
<thead>
<tr>
<th>Learning time: 19h 12m</th>
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<tbody>
<tr>
<td>Theory classes: 4h</td>
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<tr>
<td>Practical classes: 4h</td>
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<tr>
<td>Self study : 11h 12m</td>
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## Environmental noise assessment

**Description:**
Establish the criteria and procedure for the assessment of environmental noise  
Case study of theoretical evaluation of environmental noise  
Experimental noise assessment caused by an activity using a sound level meter.

**Specific objectives:**
Have the basic tools to proceed with an assessment of environmental noise  
Understand how to assess environmental noise  
Learn to evaluate a real noise caused by activities

<table>
<thead>
<tr>
<th>Learning time: 26h 24m</th>
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<tbody>
<tr>
<td>Theory classes: 7h</td>
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<tr>
<td>Laboratory classes: 4h</td>
</tr>
<tr>
<td>Self study : 15h 24m</td>
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</tbody>
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## Generation of sound

**Description:**
Presenting the fundamentals of noise generation  
Solving problems related to the generation of sound

**Specific objectives:**
Understand how to generate noise and set a sound source  
Learn how to characterize acoustic sound sources

<table>
<thead>
<tr>
<th>Learning time: 14h 23m</th>
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<tbody>
<tr>
<td>Theory classes: 4h</td>
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<tr>
<td>Practical classes: 2h</td>
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<tr>
<td>Self study : 8h 23m</td>
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**Sound propagation**

**Learning time:** 33h 36m
- Theory classes: 4h
- Practical classes: 2h
- Laboratory classes: 8h
- Self study: 19h 36m

**Description:**
- Theory about the effects that affect sound propagation
- Problems related to the phenomena of sound propagation
- Computational acoustic impact of a great activity in your environment

**Specific objectives:**
- Understand the phenomena that affect sound propagation
- Properly characterize and predict the propagation of sound and reduce it as a matter of noise control strategy.
- Learn to make noise impact studies of great sources in its environment

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**Qualification system**

Home work individual activities: 35%

Experimental work on acoustic impact assessment of an activity: 35%

Computer practice on acoustic impact assessment: 30%

**Regulations for carrying out activities**

Results not delivered within the deadline will result in zero points for the activity.

**Bibliography**

**Basic:**

**Complementary:**