

## 25236 - Radioactive contamination, acoustic and vibration pollution

#### Información del Plan Docente

Academic Year 2016/17

**Academic center** 201 - Escuela Politécnica Superior

**Degree** 277 - Degree in Environmental Sciences

**ECTS** 6.0

Course

Period Four-month period

Subject Type Optional

Module ---

- 1.Basic info
- 1.1.Recommendations to take this course
- 1.2. Activities and key dates for the course
- 2.Initiation
- 2.1.Learning outcomes that define the subject
- 2.2.Introduction
- 3.Context and competences
- 3.1.Goals
- 3.2. Context and meaning of the subject in the degree
- 3.3.Competences
- 3.4.Importance of learning outcomes
- 4.Evaluation
- 5. Activities and resources

#### 5.1.General methodological presentation

The method of instruction which has been designed for this course is based on the following:

- 1. Instructor-led participatory lessons will be the method used in the course of the **theory classes**. This method endeavours to promote the active participation of the students through the formulation of questions and/or exercises which help break the monotony of the sessions. The theory classes will take place with the whole group.
- 2. In the **problem-solving practical sessions** problems and actual cases related to the theoretical content will be set and resolved. During the course of these sessions the participation of the students and cooperative work will be fostered
- 3. In the laboratory practical sessions students will be taught how to use instruments to measure the characteristic



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parameters of physical pollution. Different situations will be presented in which the students will have to measure the values of the characteristic parameters of physical pollution, analysing its impact on the environment as well as at the human level. During the course of these sessions the participation of the students and cooperative work will be fostered.

4. As both a study task and cooperative work the students will be **set a pratical assignment** in which the students will demonstrate the capabilities acquired during the course. This task will be completed in groups of three.

#### 5.2.Learning activities

The programme which is offered to the student to help him/her achieve the anticipated results comprises the following activities:

- 1. **theory classes** . Attended sessions during which the contents of the proposed topics will be developed. Their duration will be 30 hours over the course.
- 2. **Practical sessions**. Attended sessions during which problems relating to the contents of the subject will be resolved, the operation of instruments to measure the characteristic parameters of physical pollution will be explained and measurements taken; the group practial assignment will be set and associated presentations made. The sessions will take place in the Information Technology classroom, in groups of 20 students, with a total time allocation of 30 hours (15 sessions of 2 hours).
- 3. Study and cooperative work. This independent activity will focus on the completion of work in groups of three.
- 4. **Study and independent work.** The students will devote this activity to personal studies. This module will also include the participation of the student in individual activities on the course web page on *moodle*, such as the completion of exercises and question papers, as well as the interaction with other students for discussion or the exchange of information.
- 5. **Tutorials** . These may be attended (in the office of the instructor) or virtual (via the *moodle* platform). The tutorials may be individual (related to the study and the independent work) or in groups (for the tasks to be completed in groups of three).

#### 5.3.Program

- Radioactive contamination: Review of basic concepts of the ionizing radiation emissions and its interaction with
  matter; Magnitudes and radiological units; Measurement techniques of environmental radioactivity. Biological effects
  of ionizing radiations; Radioactivity and environment; Basic principles of the radiation protection; Radiological impact
  of the different sources of radiation; Radioactive waste management
- 2. Noise pollution: Physical Characteristics of noise; Noise sources; Noise measurements; Effects of noise on humans and the environment
- 3. Vibration Pollution: Physical characteristics of vibrations; Vibration sources; Vibrations measurements; Effects of vibration on humans and the environment

#### 5.4. Planning and scheduling

Calendar of attended sessions and presentations

It is estimated that the average student should dedicate to this course, worth 6 ECTS, a total of 150 hours which should encompass both attendance and non-attendance activities. The hours should be split equally between these two types of activity during the semester. The provisional calendar for the course is set out below:

Tipol 2 actividad / Semana	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Total
Actividad Presencial																				58
Teoga 2 Problemas	2	2	2	2	2	2	2		2	2	2	2	2							28 0



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Prácticas laboratorio	2	2	2	2	2	2	2				2	2	2	2				26
Trabajos																		0
en																		
grupo Salidas																		
de																		
prácticas Tutorías				1								1						2
ECTS				'								ı						2
Evaluación														2				2
Actividad																		92
No presencial																		
Trab3ajo3	4	5	4	4	4	5	4	8	6	5	5	3	1	1	4	4		73
individual												_						
Trab2ajo2	1		1		1		1			1		2	4	4				19
en																		
grupo	9	9	9	9	9	9	9	8	8	8	9	10	9	9	4	1	0	150
TOT9AL 9	9	9	Э	Э	Э	Э	Э	0	0	0	Э	10	Э	Э	4	4	0	150

### 5.5.Bibliography and recomended resources

- (BB) Radiaciones ionizantes : utilización y riesgos / Xavier Ortega Aramburu, Jaume Jorba Bisbal, ed. . Barcelona : Editions de la UPC, 1998-2000
- (BB) Bartí Domingo, Robert. Acústica medioambiental / Robert Barti Domingo . San Vicente (Alicante) : Club Universitario, D.L. 2010