Code: 1721 **Urban Environment Monitoring**
Degree: 1st cycle – Environmental Engineering
Curricular Year: 3rd **Semester Course: 1st**
Credits: 6 ECTS **Compulsory**
Language: Portuguese/English
Responsible: Ana Carla de Andrade Madeira
Other lecturer(s): Olívio Godinho Patrício and Maria Manuela Silva Nunes Reis Abreu
Web Site: http://www.isa.utl.pt/home/node/4007

1. Contact hours:
Lecture/Practicals 70 **Others** 14 **Total** 84

2. Objectives:

Atmosphere, the air layer surrounding the planet, is a fundamental resource to life. The atmosphere has a certain level of purifying capacity which, in certain conditions, acts as a sink for gases and particles. However, nowadays this filtering role has diminished due to the great increase of human activity. Thus, any substance emitted to the atmosphere that affect plants, animals and men, as well as, some materials, is considered as a pollutant. Air quality is the term that expresses the degree of pollution. The sound, also propagated by air, is present in several daily activities in which the unprotected contact with intense sounds, voluntary or involuntary, may cause damage to human health.

3. Programme:

1. Introduction to Air and Noise Pollutions
2. Global Pollution
- The Mechanism of Greenhouse Effect and the Global Warming: greenhouse gases and aerosols
- Ozone layer
3. Regional and Local Pollution
- Principal Air Pollutants: concept, type and sources
- Influence of Atmosphere on the Pollutants Dispersion, Transformation and Deposition
- Effects of Air Pollutants on the Surface: vegetation, animals and man
- Air Quality and Legislation
4. Urban Air Pollution
- Urban versus Rural microclimatic characteristics: Radiation budget and energy balance, water balance, and their changes; profiles of windspeed; urban heat island; consequences for the deposition of pollutants
- Industrial Smog and Photochemical Smog
- Effects on Buildings and Monuments
5. Indoor Air Pollution
- Type of pollutants and External and Internal Surces
6. Monitorization and Air Quality
7. Noise Pollution
- Concepts and Terminology
- Noise Propagation
- Principal Sources of Urban Noise
- Noise Regulation
- Instrumentation
- Monitorization

4. Bibliography:

Main Bibliography

Written notes covering most of the programme

Other Bibliography

Colls, J. 1997. Air Pollution. An Introduction. E & FN SPON.
Brown, R.D. & Gillespie, T.J. 1995. Microclimatic Landscape Design.. John Wiley & Sons, Inc.
Elsom, D. 1996. Smog Alert.Managing Urban Air Quality. EARTHSCAN.
Oke, T.R. 1978. Boundary Layer Climates. METHUEN.

5. Assessment:

Three theoretical and practical tests during the semester (with the possibility to eliminate parts of the subject as long as the average mark is greater than ten -10/20; the minimum mark accepted in only one test is 8 (8/20). Final examination (partial or total).

6. Estimated Workload:	168	Hours
7. Last Update:	13/7/2010	