UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

From Environmental Monitoring to Human Health: Effects of Contaminants, Tools and Models

2627-1-124R049

Title

From environmental monitoring to human health: effects of contaminants, tools and models.

Teacher

Chiara Urani
Giovanni Zambon

Language

English

Short description

The course will be divided into sections comprising:

- An introductory part on the general need for environmental monitoring and the impact of contaminants on organisms and human health.
- The ethical and scientific significance of non-animal methods, approaches, and testing in human and

environmental research (NAMs).

- the 3Rs Principles (Refinement, Reduction and Replacement). Politics and Legislation of Animal Experimentation: the EU Regulation and Directive for animal and non-animal experimentation; the 3Rs within the regulation on Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), and the OECD Test Guidelines
- From simplicity to complexity of testing models and approaches; Alternatives and non-animal testing approaches: in vivo, in vitro, in silico, Integrated Testing Strategies; Case studies on carcinogenicity and neurotoxicity of environmental contaminants: what we do, what we should do, and the way forward.
- The second part of the course will examine noise pollution as an environmental contaminant and introduce soundscape (geophonies, biophonies and anthrophony) analysis as an alternative tool (non animal-based) for monitoring and assessing environmental conditions. It will also cover the application of soundscape-based approaches to evaluate noise effects on both non-human animals and humans. Key topics include: (a) general acoustic concepts, (b) soundscapes as indicators of environmental quality, (c) bioacoustic indices, (d) human sound perception and noise impacts (psychoacoustic indices).
- A practical laboratory component will provide hands-on experience with acoustic instrumentation, data acquisition, and analysis and interpretation of noise effects on non-human animals, humans, and the environment as a whole. The computation of acoustic indices and statistical analyses will be conducted using the R environment.

Target audience

PhD students

Maximum number of participans

No limits

Assessment method

Final test on the presented issues.

CFU / Hours

2 CFU:

- 1 CFU Chiara Urani (8 hours lesson)
- 1 CFU Giovanni Zambon (4 hours lesson + 5 hours lab)

Teaching period and mode

February - June
Period to be agreed also with the participants

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING