UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Environmental Sustainability and Health

2425-2-F7501Q106

Aims

The general objectives of the course are:

- acquiring the conceptual and procedural knowledges to evaluate the health impacts and the toxicological risk due to the presence of pollutants in the environment.
- acquiring the capability to use already available data, from the literature or databases, to perform a simplified health impact assessment study and to the comprehension of the procedure to evaluate the potential risk for the health.
- develop tthe capability to critically analyze literature data, development of a holistic approach (from the pollutant in the environment to the health).

Contents

The course “Health and Environmental Sustainability” aims at providing the knowledges on the necessary procedure to define and quantify the impacts on human health of environmental pollutants, with specific focus on airborne pollution, also in the context of the climate change.
Class lessons aim at allowing the comprehension of the complex interactions that link human exposure to pollutants and the onset of diseases. The procedures typically applied in the risk assessment and in the health impact assessment will be the basis for study evaluation.

Detailed program

The basic knowledge required to follow the course is the one typical of environmental sciences (pollutants’ emission, repartition of pollutants into the environmental compartments and biological effects of the pollutants on

living organisms, particularly humans). A brief recap of the most relevant subjects will be provided at the beginning of the course. Specifically, the course will deal with the impacts on health of environmental stressors, including chemical, physical, and biological pollution also in the context of the climate change.
The course will provide the theory and the methodologies required to the definition, quantification, and potential reduction of the health impacts from products and processes. This will be achieved by building on concepts proper of the toxicology, environmental epidemiology and of the “risk assessment” framework, including therefore the relation among emission sources, human exposure, chemical and physical properties of pollution and the biological mechanisms of action at cellular level and of the pathogenic onset.
Human exposure in outdoor environments will be coupled with indoor environments exposures. The relationship between exposure and potential adverse effects will be explored by the toxicological concepts of margin of exposure (MOE) and the hazard quotient (HQ).
A simplified version of Health impact assessment will be used to deal with the prevention and mitigation processes, such as the management and projecting of living environments (productive, urban, domestic) in relation to the health safety, also considering the Italian framework “valutazione integrata di impatto ambientale e sanitaria (VIIAS)”.
Specific focus will be devoted to the health impacts related to airborne pollutants (particulate or gases) deriving from different emission sources and in relation to the policies and practices for a sustainable approach to air pollution also in the context of the One Health concept.
The use of video and scientific publication during the course exercises will also allow to understand and deepen the relation among the pollutants presented, the climate change and, the impacts on human health.
The analytical study and the discussion of case studies will be additional methods of improving the insight taking into consideration practical examples highlighting the parameters of relevance of the evaluation of the potential risk for health after exposure.

Prerequisites

Students are not requested to have previous specific prerequisites or knowledges. The knowledge deriving from taking the course of “Applied environmental biology” could help in easily understanding specific subjects presented in this course.

Teaching form

The course is structured in 6 CFU of class lessons equivalent to 48 hours organized as follows:

- 19 lessons of 2 hours in person, Delivered Didactics. Lessons will start as delivered didactics but may continue as Interactive Teaching.
- 5 lessons of 2 hours in person, Interactive Teaching.

The lessons, both Delivered Didactics and Interactive Teaching, may use the support of online instrument such as Wooclap or Socrative.

Textbook and teaching resource

The teaching materials will be based on extracts from presentations, on scientific publication and other relevant documents shared during the classes and uploaded on the e-learning platform. Addition teaching material of relevance will be shared in itinere. Textbooks for reference will be presented at the beginning of the course for

possible scientific insights into specific topics.

Semester

The course is planned during the second semester.

Assessment method

The final exam will be an oral interview. The oral interview will examine the comprehension of the theory presented during the classes and therefore the capability to develop and apply them to theoretical cases demonstrating the level understanding of the methodologies to define health impacts or risks and of technical language required by the scientific area.

Office hours

Students' reception is open by prior appointment to be required by email to the professor

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | SUSTAINABLE CITIES AND COMMUNITIES | CLIMATE ACTION