

Syllabus Module 206

N°	Core module in Environmental and occupational Health Science
Coordinator	Aurore Gely-Pernot
Dates	5 th , 12 th , 19 th , 26 th of September and 3 rd of October 2019
Credits/ECTS	3 ECTS
Duration	5 days of 6 hours face to face, and personal or group work (estimation 30h)
Location	EHESP 20 Avenue George Sand 93210 LA PLAINE ST DENIS
Description	<p>In general, the EOHS program aims to train practitioners to identify risks run by the general population, consumers or workers exposed to nuisances and hazardous agents, and to propose measures designed to abate exposures and health impacts. It comprises a broad range of disciplines and viewpoints (from individual vulnerability factors to public policies) in order to stimulate the students' capacity to develop a consistent and cross-cutting problem-solving approach.</p> <p>In this context, this introductory module to the second year of the Master focuses on principles of health security. Expertise and management of "early signals", environmental health surveillance and the risk abatement tools will be investigated. This module aims as well to introduce the notion of risk assessment (module to go further: "Impact Assessment in Environmental Health"), global health (modules to go further: "The control of environmental infectious diseases" and "Global environmental changes module") and to consolidate notion of toxicology (module to go further: Critical windows of exposures and vulnerability). Finally, this module presents epidemiological methods developed for the investigation of health problems. A group assignment whereby students will prepare and expose critical analyses of a set of papers from the scientific literature in a variety of domains will force them to draw from these different disciplinary areas in an integrative way. Each of these parts is presented in syllabus appendices.</p>
Prerequisites	M1 level in the same area
Course learning objectives	<p>Consolidate the competencies acquired in environmental health sciences in M1</p> <ul style="list-style-type: none"> - Apply analysis skills and techniques to assess and understand an environmental or occupational health problem - Discuss the basic biological concepts that allow to evaluate the exposure-response relationships <p>Describe the principles of exposure and risk assessment for nuisances and hazards related to the environment or to occupational settings</p>
Structure (details of sessions title/speaker/date /duration)	<ul style="list-style-type: none"> - Epidemiology: Methodology in occupational health, Rémy Slama, environmental epidemiology, Johanna Lepeule - Exposure science: an introduction, Philippe Glorennec - Risk assessment : rationale, methods and applications, an introduction, Philippe Glorennec and Rémy Slama - Health security (1): "early signal" and environmental health surveillance, Denis Zmirou Navier - Risk abatement tools: emission limits and control, labeling, fiscal policies, Lionel Moulin - Occupational sciences, Tony Musu - Main human health impact of toxic agents, Aurore Gely-Pernot - Paper analysis in environmental health (1). Aurore Gely-Pernot - Paper analysis (2): Group presentations (and exam preparation). Aurore Gely-Pernot and Séverine Deguen
Resources	<p>Books</p> <p>All readings and materials will be posted on REAL. Readings are available below for each session.</p> <p>Website, online library</p>
Course requirement	<p><u>Assignments:</u> Students have to come to class prepared to discuss issues after reading the course material on the REAL facility, in particular for Toxicology (1) and Paper analysis (2).</p> <p>Group work (about 5-6 students) on paper analysis, with oral presentation (based on previous years' exams). Students are expected to read and analyse selected papers for the group work before the courses.</p>
Grading and assessment	<ol style="list-style-type: none"> 1) Group work : paper will be read, Presentation made by groups (30% of final grade) 2) On table test of 2 hours: scientific paper reading and answers to a set of questions (critical analysis of

	<p>the study design, of exposure assessment, writing of the hidden summary...). Grade on 20 at least equal to 10.</p> <p>Note also that students will complete a questionnaire that assesses their own and their teammates' contributions to group work. All team members will receive the same grade except if it is clear that a student has not participated effectively (attended and contributed to meetings; made timely, helpful contributions; been constructive, etc.). In that case, the student's grade will be lowered accordingly.</p>
Course policy	<p>Attendance & punctuality Regular and punctual class attendance is a prerequisite for receiving credit in a course. Students are expected to attend each class. Attendance will be taken at each class. The obligations of attendance and punctuality cover every aspect of the course: - lectures, conferences, group projects, assessments, examinations, as described in EHESP Academic Regulations http://mph.ehesp.fr EHESP Academic Regulation Article. 3). If students are not able to make it to class, they are required to send an email to the instructor and to the MPH program coordinating team explaining their absence prior to the scheduled class date. All supporting documents are provided to the end-of-year panel.</p> <p>Students who miss class are responsible for content. Any student who misses a class has the responsibility for obtaining copies of notes, handouts and assignments. If additional assistance is still necessary, an appointment should be scheduled with the instructor. Class time is not to be used to go over material with students who have missed class.</p> <p>Lateness: Students who are more than 10 minutes late may be denied access to a class. Repeated late arrivals may be counted as absences (See http://mph.ehesp.fr EHESP Academic Regulation Article. 3 Attendance & Punctuality)</p> <p>Maximum absences authorized & penalty otherwise Above 20% of absences will be designated a fail for a given class. The students will be entitled to be reassessed in any failed component(s). If they undertake a reassessment or they retake a module this means that they cannot normally obtain more than the minimum pass mark (i.e. 10 out of 20)</p> <p>Exceptional circumstances Absence from any examination or test, or late submission of assignments due to illness, psychological problems, or exceptional personal reasons must be justified; otherwise, students will be penalized, as above mentioned. Students must directly notify their professor or the MPH academic secretariat before the exam or before the assignment deadline. Before accepting the student's justification, the professor or the MPH academic secretariat has the right to request either a certificate from the attending physician or from a psychologist, or from any other relevant person (See http://mph.ehesp.fr EHESP Academic Regulation Article 4 Examinations).</p> <p>Courtesy: All cell phones/pages MUST be turned off during class time. Students are required to conduct themselves according to professional standards, eating during class time is not permitted during class time, such as course or group work.</p>
Valuing diversity	<p>Diversity enriches learning. It requires an atmosphere of inclusion and tolerance, which oftentimes challenges our own closely-held ideas, as well as our personal comfort zones. The results, however, create a sense of community and promote excellence in the learning environment. This class will follow principles of inclusion, respect, tolerance, and acceptance that support the values of diversity. Diversity includes consideration of: (1) life experiences, including type, variety, uniqueness, duration, personal values, political viewpoints, and intensity; and (2) factors related to "diversity of presence," including, among others, age, economic circumstances, ethnic identification, family educational attainment, disability, gender, geographic origin, maturity, race, religion, sexual orientation and social position.</p>
Course evaluation	<p>EHESP requests that you complete a course evaluation at the end of the school year. Your responses will be anonymous, with feedback provided in the aggregate. Open-ended comments will be shared with instructors, but not identified with individual students. Your participation in course evaluation is an expectation, since providing constructive feedback is a professional obligation. Feedback is critical, moreover, to improving the quality of our courses, as well as for instructor assessment.</p>

Session 1	Introduction to Risk assessment
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Speakers	Philippe Glorennec
Session Outline	An introduction to risk assessment: rationale, methods and applications: in this course students will identify the interest of risk assessment for prevention of chemical hazards, discover the main practical applications of this approach and current methodologies. Limitations will also be discussed regarding the different uses for risk assessment.
Learning Objectives	-To know possible aims for exposure assessment current methods in dietary, environmental, and occupational exposures. -To identify the interest of risk assessment for prevention of chemical hazards, to know the main practical applications and limits of this approach and current methodologies.
Duration	3 Hours
Training methods	Lecture and home work
Reading	(1) National Research Council of the National Academies. Science and decisions. Advancing risk assessment. Washington DC, USA: The National Academies Press; 2009. (2) OEHHA A guide to health risk assessment http://www.oehha.ca.gov/pdf/HRSguide2001.pdf

Session 2	Epidemiology
Speakers	Rémy Slama
Session Outline	This lecture puts environmental epidemiology in the broader context of environmental risk assessment and risk management. It illustrates all the steps going from the identification of a possible threat to human health in the environment to the accurate characterization of the associated hazards and risks and finally the management of any identified risk.
Learning Objectives	After this lecture, the student should be able: - to distinguish the approach of the main disciplines contributing to environmental risk assessment - have an overview of some key principles that are or have been applied in the management of environmental health risks
Duration	3 hours
Training methods	Lecture
Readings	<u>Required Reading</u> <u>Supplemental Reading</u>
Speakers	Johanna Lepeule
Session Outline	The goal of the lecture is to provide the student with an introduction to the most recent research in the field of health effects of air pollution as well as a broader understanding of sources and spread of air pollution and its health effects. Examples from the literature will be used to illustrate the basic methods.
Learning Objectives	Discuss the different air pollutants and their sources Review their major health effects (Short and long term effects) Who are the most vulnerable Identify the different study designs, their advantages disadvantages Exposure assessment methods Exposure misclassification and bias
Duration	3 hours

Training methods	Lecture
Readings	<u>Required Reading</u> <u>Supplemental Reading</u>

Session 3	Principles of health security
Speakers	Denis Zmirou-Navier and Lionel Moulin
Session Outline	The notion of 'Health security' built up during the years 90ies on the experience of public health crises and drew from the learnings on what failed in risk prevention and management. Three courses will be given during this module on the principles and the general framework of health security. In the first one, after a definition of the key concepts of health security, the focus will be put on the role and organization of scientific expertise bodies and on the procedures they follow to deliver to stakeholders and decision makers assessments of suspected or known risk factors and recommendations on how best abate risks associated with environmental stressors. The second course will expose, based on examples, how monitoring of the quality of environmental media and of adequate health data may inform on risk or vulnerability factors, and how such information may be used to design environmental health policies and to evaluate their efficacy. The third course will introduce, through illustrations drawn from the French national environmental health action plans, the array of regulatory, fiscal or information tools that may be used by local, national or international authorities to manage activities that pose risks to the environment so as to maintain health impacts as low as possible.
Learning Objectives	The general objective of these courses is to give the students a systemic appraisal of environmental health policies and the capacity to identify the key actors of these policies.
Duration	6.5 hours
Training methods	Lecture and Case Study
Reading	

Session 4	Toxicology
Speakers	Aurore Gely-Pernot
Session Outline	The aims of this course will be to show how toxic agents can impact human health. We will focus on irritation, neurotoxic, genotoxic and reprotoxic effects induce by xenobiotics. We will also aboard the effects of the low doses and the combined exposure (cocktail effect).
Learning Objectives	To understand how toxicology research is needed and used in human health risk assessment.
Duration	3 hours
Training methods	Lecture
Reading	Online courses: Basic concepts of toxicology as they apply to environmental health http://real.ehesp.fr/course/view.php?id=997
Session 5	Occupational Health
Speakers	Tony Musu & Mounia El Yamani

Session Outline	<p>Will come</p> <p>Background Since 2003, Tony Musu has been working as researcher in the ETUI's Health and Safety Department. On behalf of the ETUC, he takes part in various REACH-related EU working groups and he was a Board member of the European Chemicals Agency (ECHA) in the period 2007-2012. He is also a member of the Ad Hoc WG on Chemicals within the Luxembourg Advisory Committee on Health & Safety at work.</p> <p>Mounia El Yamani is head of unit at "Santé public France" in occupational area</p> <hr/> <p>Areas of activity</p> <ul style="list-style-type: none"> • Monitoring on REACH and trade union network on chemicals • REACH regulation, Worker protection legislations • Occupational exposures assessment of workers, in France: tools and methods • Omeganet network
Learning Objectives	
Duration	6 hours
Training methods	Lecture
Reading	

Session 6	Global health and Infectious diseases
Speakers	Michèle Legeas
Session Outline	<p>Nowadays, infectious diseases are generally seen as a minor public health problem and not a real concern related to environmental health. But that's not true in fact.</p> <p>The aims of this course will be to show how epidemics can weight on health, even in richest countries. This will be approached beginning the class with a short working group on different kinds of recent epidemics in the world. The thinking would be shared and a synthetic lecture would focus on main current stakes with infectious agents.</p>
Learning Objectives	To inform all students on the burden of transmissible diseases related to environment and to demonstrate how it's already necessary to take them into account despite epidemiological transition.
Duration	3 hours
Training methods	Working group and lecture
Reading	Page of WHO's website: http://www.who.int/emergencies/diseases/en/

Session 7	Introduction to human biomonitoring (HBM)
Speakers	Arthur David

Session Outline	<p>More than one hundred thousand xenobiotics are currently in use in the human population. Some of these xenobiotics (e.g. plasticizers, biocides and pesticides...) can enter the human body as complex mixtures and can potentially affect critical biological targets inside the body. Exposure to xenobiotic mixtures is suspected of contributing to non-communicable chronic diseases, which are the major causes of premature death worldwide. Human Biomonitoring (HBM) is a scientific technique that allows to assess to what extent these environmental substances have entered our bodies and how exposure may be changing over time. By measuring the concentration of natural and synthetic compounds in body fluids, biomonitoring can provide valuable information on environmental exposures and, in some cases, help, identifying potential health risks. The lecture will first explain why we need to do HBM and then introduce this concept and its aims. The methodologies used and associated challenges will be explained before giving example HBM studies performed at the national and European levels.</p>
Learning Objectives	<ul style="list-style-type: none"> - Why HBM and what is HBM: context and aims - How to do human biomonitoring: methodologies and challenges - Interpretation of results - National and European human biomonitoring studies - Futures of HBM
Duration	2 Hours
Training methods	Lecture
Reading	<ul style="list-style-type: none"> - P.J. Landrigan, R. Fuller, N.J.R. Acosta, O. Adeyi, R. Arnold, N.N. Basu, A.B. Balde, R. Bertollini, et al., The Lancet Commission on pollution and health, Lancet (2017) - Angerer, J., Ewers, U. & Wilhelm, M. 2007 Human biomonitoring: state of the art. Int. J. Hyg. Environ. Health 210 , 201–228. (doi:10.1016/j.ijheh.2007.01.024) - Human biomonitoring: facts and figures. WHO/Europe - World Health Organisation. European Environment and Health Process.