

Degree	Type	Year	Semester
2501915 Environmental Sciences	OB	3	2

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

## Contact

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## Use of Languages

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: Yes  
Some groups entirely in Spanish: No

## Teachers

Ferran Torres  
David Molina Gallart

## Prerequisites

No prerequisites

## Objectives and Contextualisation

### INTRODUCTION

The subject is structured in two complementary parts. The first one studies how the environmental environment can affect the health of people and the approach will be carried out from the epidemiological perspective. In the second part, the integral management of the environmental risks of catastrophic and immediate impacts such as those of a natural or technological nature is posed.

### OBJECTIVES

Know the main environmental risk factors for health.

Provide tools for the understanding and discussion the epidemiological studies.

Know the main scientific perspectives on environmental risks as well as contrast scientific and social visions from the critical analysis.

Introduce students to risk management.

Know about selected examples of specific types of risks.

## Competences

- Adequately convey information verbally, written and graphic, including the use of new communication and information technologies.
- Analyze and use information critically.
- Collect, analyze and represent data and observations, both qualitative and quantitative, using secure adequate classroom, field and laboratory techniques
- Demonstrate adequate knowledge and use the most relevant environmental tools and concepts of biology, geology, chemistry, physics and chemical engineering.
- Demonstrate adequate knowledge and use the tools and concepts of the most relevant social science environment.
- Demonstrate concern for quality and praxis.
- Demonstrate initiative and adapt to new situations and problems.
- Develop communication strategies on environmental issues, including environmental risks
- Information from texts written in foreign languages.
- Integrate environmental information in order to formulate and test hypotheses.
- Integrate physical, technological and social aspects that characterize environmental problems.
- Learn and apply in practice the knowledge acquired and to solve problems.
- Quickly apply the knowledge and skills in the various fields involved in environmental issues, providing innovative proposals.
- Teaming developing personal values regarding social skills and teamwork.
- Work autonomously

## Learning Outcomes

1. Adequately convey information verbally, written and graphic, including the use of new communication and information technologies.
2. Analyze and use information critically.
3. Communicate environmental problems with proper attention to the problems of environmental risk and the relevant regulations in the fields of safety and environmental health.
4. Demonstrate concern for quality and praxis.
5. Demonstrate initiative and adapt to new situations and problems.
6. Demonstrate knowledge of some of the main areas of scientific disciplines environment.
7. Demonstrate knowledge of some of the main areas of the social sciences in the environment.
8. Identify processes sciences, life sciences and social sciences in the surrounding environment and evaluate them properly and originally.
9. Information from texts written in foreign languages.
10. Integrate environmental information with environmental knowledge acquired from the sequence of observation, recognition, synthesis and modeling.
11. Learn and apply in practice the knowledge acquired and to solve problems.
12. Learn and apply the most important epidemiological analysis of environmental risks and the overall risk analysis methodologies.
13. Observe, recognize, analyze, measure and properly and safely represent environmental processes.
14. Teaming developing personal values regarding social skills and teamwork.
15. Work autonomously

## Content

1. Presentation of the subject. Health in the management of environmental risk. Introduction to environmental epidemiology, concepts of public health.
2. Principle of precaution and risk assessment for health. Evaluation of carcinogens in humans by IARC.
3. Measure of disease effect. Incidence, prevalence, rates and attributable risk. Sources of information
4. Measure of exposure. General concepts and measures in the environment. Questionnaires and biomarkers.
5. Types of epidemiological studies for the description and evaluation of causal associations between exposure and disease.
6. Case studies and controls.
7. Cohort studies. Relative risk

8. Bias, factors of confusion and stratification. Causal criteria.
9. Exposure to organochlorine compounds.
10. Water pollution
11. Atmospheric pollution. Main pollutants and acute and chronic effects.
12. Electromagnetic fields: ionizing and non-ionizing radiation and its effects on health.
13. Climate change and health.
14. Introduction to the integral management of environmental risk: definition, classifications and measures.
15. Environmental risk and impacts in the current world.
16. The perception of risk
17. The communication of risk
18. Risk, vulnerability and distributive justice.
19. Flooding Case study of the Rubí stream.
20. Extreme weather phenomena.
21. Drought
22. Earthquakes
23. Technological risks. Industrial risk

## Methodology

Theoretical in classroom, practices in pc lab and field work.

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Field trip	15	0.6	3, 10
Practices	20	0.8	2, 11, 12, 3, 5, 4, 10, 13, 9, 1, 15, 14
Theoretical	45	1.8	2, 11, 12, 3, 4, 10, 13
Type: Autonomous			
Practices and informs redaction	75	3	2, 11, 12, 3, 5, 4, 10, 13, 9, 1, 15, 14
Study	70	2.8	2, 11, 12, 5, 4, 10, 9, 15

## Assessment

1. There are two partial exams, one for each part of the subject. It is necessary to obtain more than 3 (out of 10) of each partial exam to be able to do an average with the practices and with the other part of the subject.
2. If the global mark of each part does not exceed 5, a final recovery exam must be carried out.
3. Practices must be carried out and approved to be able to make a mean.
5. The block of environmental epidemiology is worth 50% of the final note as well as the environmental risk.

To ask for a reevaluation the student must have been received a mark in activities that represent at least 2/3 of the global mark during the course.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Exam	60% (Epidemiology) 60% (Risc)	0	0	2, 11, 12, 6, 7, 8, 13, 1
Practices and field trip	40% (Epidemiology) 40% (Risk)	0	0	2, 11, 12, 3, 6, 7, 5, 4, 8, 10, 13, 9, 1, 15, 14

## Bibliography

### Bigliography

- Baker D. i Nieuwenhuijsen MJ. Environmental Epidemiology. Study methods and application. Oxford University Press (disponible a la biblioteca de ciències)
- Nieuwenhuijsen MJ. Exposure assessment in occupational and environmental epidemiology. Oxford University Press. (disponible a la biblioteca de ciències)
- Martínez-Navarro F., Antó JM, Castellanos PL, Gili M, Marset P, Navarro V., ed. Salud Pública. Madrid: Mcgraw-Hill- Interamericana de España S.A.U. 1998 ; cap. 15: 261-71. (disponible a la biblioteca de Ciències)
- Antó JM, Sunyer J. La epidemiología ambiental. En: Martínez-Navarro F., Antó JM, Castellanos PL, Gili M, Marset P, Navarro V., ed. Salud Pública. Madrid: Mcgraw-Hill- Interamericana de España S.A.U. 1998 ; cap. 15: 261-71. (disponible a la biblioteca de Ciències)
- Ayala Carcedo, F.J. y Olcina Cantos, J. (eds) (2002): *Riesgos Naturales*. Barcelona: Ariel
- Calvo García-Tornel, F. (2001): *Sociedades y Territorios en Riesgo*. Barcelona, Ediciones del Serbal.
- Llasat. M.C. i Corominas, J. (2010): Riscos associats al clima, a J.E. Llebot (ed): Segon Informe sobre el Canvi Climàtic a Catalunya. Barcelona: Institut d'Estudis Catalans i Consell Assessor per al Desenvolupament Sostenible de la Generalitat de Catalunya.  
<http://www15.gencat.cat/cads/AppPHP/images/stories/publicacions/informesespecials/2010/sicccat/infor>
- Smith, K. i D. Petley (2009): Environmental Hazards. Assessing risk and reducing disaster. Londres, Routledge (5ena edició).
- Vilaplana, J.M. (2008) RISKCAT. Els riscos naturals a Catalunya. Barcelona: Consell Assessor pel Desenvolupament Sostenible  
[http://www15.gencat.net/cads/AppPHP/images/stories/publicacions/informesespecials/2008/els\\_riscos\\_r](http://www15.gencat.net/cads/AppPHP/images/stories/publicacions/informesespecials/2008/els_riscos_r)
- Kieffer, Susan W. 2013: The Dynamics of Disaster. New York: Norton.

### web links

WHO - OMS Organització Mundial de la Salut

<http://www.who.int/es>

Agència Europea del Medi Ambient

<http://www.eea.eu.int>

Programa de les Nacions Unides pel Medi Ambient

<http://www.unep.org/>

US Environmental Protection Agency

<http://www.epa.gov>

International Society for Environmental Epidemiology

<http://www.iseepi.org/>

WFP\_ Programa Mundial d'Aliments

<http://www.wfp.org/>

European Centre for Environment and Health	<a href="http://www.euro.who.int/ecehrome">http://www.euro.who.int/ecehrome</a>
Publicacions de la UE. Sovint hi ha publicacions disponibles en pdf sobre salut i medi ambient	<a href="http://bookshop.europa.eu/">http://bookshop.europa.eu/</a>
Agència internacional d'avaluació del càncer	<a href="http://www.iarc.fr">http://www.iarc.fr</a>
Natural Hazards Center	<a href="http://www.colorado.edu/hazards">http://www.colorado.edu/hazards</a>
Centre for Research on the Epidemiology of Disasters	<a href="http://www.cred.be/">http://www.cred.be/</a>
Estratègia Internacional per a la Reducció de Desastres	<a href="http://www.unisdr.org">http://www.unisdr.org</a>
Protecció Civil Espanya	<a href="http://www.proteccioncivil.org">http://www.proteccioncivil.org</a>
Direcció General de Protecció Civil (Catalunya)	<a href="http://www20.gencat.cat/portal/site/interior/">http://www20.gencat.cat/portal/site/interior/</a>
Consortio de Compensación de Seguros	<a href="http://www.conorseguros.es">http://www.conorseguros.es</a>