Faculty *(jednostka organizacyjna)*
Department of Paediatrics and Allergy, Copernicus Memorial Hospital, Medical University of Lodz, person in charge: prof. dr hab. n. med. Joanna Jerzyńska, e-mail: joanna.jerzynska@umed.lodz.pl; phone: +48 426895972
Specialization

Kind *(kierunek)*

Type *(forma studiów (stacjonarne, niesteacjonarne)*
stationary

Term (semestr)
summer

Subjects ID (*kod przedmiotu – generuje się automatycznie)*

Course supervisor (*kierownik przedmiotu)*
Professor Kinga Polańska, PhD, MPH

Subjects name
Environmental Health: A Crucial Determinant of Population Health

Unit *(nazwa jednostki prowadzącej zajęcia)*
Department of Pediatrics and Allergy, Copernicus Memorial Hospital, Medical University of Lodz

Course profile *(profil)*
academic

Speciality

Level of course unit *(podstawowy/zaawansowany etc.)*
International Doctoral School

Type of course unit *(obowiazkowy/fakulatywny)*
Optional

Course aims:
The aim of the course "Environmental Health: A Crucial Determinant of Population Health" is to provide students with fundamental knowledge of environmental health sciences and their importance to population health. The course covers major environmental hazards, including endocrine-disrupting chemicals (EDCs), heavy metals, air pollution, and climate change, as well as their impacts on human health and disease burden.

Students will gain an understanding of the principles of environmental health risk assessment, risk management, and risk communication. The course also examines current national and international regulations, together with methods for evaluating the effectiveness of policies and interventions aimed at preventing and reducing environmental threats to population health.

The course fosters interdisciplinary thinking and develops the critical analytical and research skills necessary to identify, assess, mitigate, and adapt to environmental health challenges. Emphasis is placed on evidence-based public health strategies and policy interventions that promote healthier populations and more sustainable environments.

The objectives of the course are:

- To provide a basic understanding of key environmental hazards, their associated health outcomes, and vulnerable populations.
- To understand the principles of risk assessment, risk management, and risk communication in environmental health.
- To examine regulatory measures as well as educational and intervention strategies aimed at preventing and reducing environmental health risks.
- To develop the ability to critically evaluate environmental health policies and public health interventions designed to protect population health.

Types of educational activities

Subject	Language course	Self-study	Lecture	Exercises	Laboratory	Seminar	Practical	e-learning	Profession practice	Other (what?)	ECTS points
						20					

ECTS Credits:

Name of course unit's faculty
Department of Pediatrics and Allergy, Copernicus Memorial Hospital, Medical University of Lodz

Prerequisites
A prior understanding of human biology as well as the basic knowledge in epidemiology, toxicology and public health are not required, but would be helpful.

Learning activities and teaching methods

Seminars - multimedia presentations, discussion, group and individual work

Course unit content

1. Introduction to Environmental Health and Population Health (8 hours)

Environmental determinants of health and their contribution to the global burden of disease

- Risk factors, determinants, direct and indirect contributors to health outcomes, links between risk factors
- Sources, pathways, and routes of exposure to environmental hazards
- Chemical, physical, and biological hazards across the life course

Principles of environmental epidemiology and exposure science

- Risk assessment (hazard identification, exposure assessment, dose-response assessment, risk characterization), risk management, and risk communication

- Differences between environmental and occupational exposure assessment and their implications for human health, including cumulative and multiple exposures
- Biomarkers of exposure, effect, and susceptibility: methodological issues, strengths, and limitations
- Human and environmental monitoring: biological samples versus environmental samples
- Confounders, mediators, and moderators in environmental health research
- Vulnerable populations across the life course, including pregnant women, children, older adults, and socially disadvantaged groups
- Data collection process - study protocol, information for the study participants, informed consent form to participate in the study, ethical issues
- The exposome concept and its applications in understanding disease etiology

Global Burden of Disease

2. Major Global Environmental Health Challenges (10 hours)

Air Pollution and Health

- Outdoor and indoor air pollution: sources, major pollutants, and exposure pathways
- Short-term and long-term health effects, including respiratory, cardiovascular, metabolic, and neurodevelopmental outcomes
- Air quality monitoring, standards, and public health interventions
- The role of healthcare professionals in prevention and patient education

Climate change and health

- Global warming – the scale of the problem
- Heat stress: definition, measurement, short-term and long-term health impact and vulnerable populations
- Urban heat islands and impacts on health and well-being
- Adaptation and mitigation strategies in healthcare and public health

Endocrine Disrupting Chemicals (EDCs) and health

- Definition, sources, and routes of exposure
- Health effects, including reproductive disorders, obesity, diabetes, cancer, and neurodevelopmental outcomes
- Risk assessment, regulatory frameworks, and communication of risks
- Current challenges and future directions in environmental health research

Urbanization, Built Environment, and Health

- Urban planning and healthy cities
- Green and blue spaces, active transportation, and walkability
- Creating healthier and more sustainable urban environments

Environmental Health Inequalities and Environmental Justice

- Unequal distribution of environmental exposures and risks
- Social determinants of environmental health
- Environmental justice and health equity
- Strategies to reduce environmental health inequalities

3. Prevention, Policy, and Public Health Action (2 hours)

Translating scientific evidence into environmental and public health policies
Regulatory approaches to environmental health protection
Gaps between scientific knowledge, regulation, and implementation
Examples of successful environmental health interventions and prevention programs
Educational strategies and public engagement in environmental health

Environmental health surveillance systems and databases
Assessing the effectiveness of policies and interventions aimed at reducing environmental risks
The role of physicians and healthcare professionals in environmental prevention, advocacy, and risk communication

Knowledge
Students will gain knowledge of environmental health sciences, including key environmental hazards, associated health outcomes, and vulnerable populations. They will also understand the principles of risk assessment, risk management, and risk communication, and become familiar with the regulatory measures, educational strategies, and intervention approaches used to mitigate these hazards.

Skills
1. Ability to apply knowledge to assess risks associated with exposure to environmental factors in general and vulnerable individuals
2. Ability to communicate risks associated with exposure to environmental factors
3. Ability to plan and perform interventions to reduce exposure to environmental contaminants and related health effects

Competencies
Students will gain competences in taking an environmental history as well as assessing, communicating and minimizing risks associated with exposure to environmental factors.

Required learning resources
N/A

Recommended learning resources
Dean Baker and Mark J Nieuwenhuijsen. Environmental epidemiology Study methods and application. Oxford University Press 2008. ISBN 978-0-19-852792-3
Scientific publications and reports provided during the course.

Assessment methods
Assessment criteria: attendance at seminars
Assessment will be based on the quality of the presentation, including both its content and form. Students, working individually or in small groups, will prepare and present a PowerPoint presentation on a selected topic.

Additional information
Course coordinators:
Professor Kinga Polańska, PhD (e-mail: kinga.polanska@umed.lodz.pl), Professor Joanna Jurewicz, PhD (e-mail: joanna.jurewicz@umed.lodz.pl)

Signature
I hereby state that the content of the curriculum included in the syllabus below is the result of my individual work completed as part of work contract/cooperation resulting from a civil law contract, and that author rights to this title are not the property of a third party.

Course language: English