

Smart cities climate and sustainability in the context of the bioclimatic regime of cities, environmental risks and public health

Following implementation of New Urban Agenda (United Nations, 2017) ; urban activities of the WMO and inter-programme / recommendations of Commission for Atmospheric Sciences and Commission for Basic Systems (2018)

Resilience actions to counteract the effects of climate change and emergencies in cities:

Part 1. Urban biometeorology and ways to improve the comfort of the urban environment

Responsible performers -

- Bashmakova I.Kh. (PhD Researcher, formerly at the Department of atmospheric science, Helsinki University, Finland)
- Maria Cristina Mammarella (PhD Researcher, formerly at the Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Economico Sostenibile /ENEA, Rome, Italy),

Aspects of the adaptation strategy proposed by international organisations (UN, WMO, WHO) to counter the impact of climate change, increasing the sustainability of the urban environment are considered

MODULE 1. BASIC KNOWLEDGE OF CLIMATE CHANGE AND ITS CONSEQUENCES IN THE CONTEXT OF THE BIOCLIMATIC REGIME OF CITIES

Examples of long-term climate change scenarios and the values of surface temperature changes obtained on their basis air. General characteristics of the impact of climate change on human health, including the spread and course of some infectious diseases. Peculiarities of the impact of extremely high and extremely low temperatures on health. Basic information on adaptation / acclimatisation of people and methods of acclimatisation assessment. Examples of analysis of the impact of future climate changes on human thermal state at different times, socio-economic consequences of temperature climate risk.

MODULE 2. URBAN BIOMETEOROLOGY

Features of the urban microclimate that affect human thermal sensation. Characteristics of the formation of heat stress in urban conditions. Modern assessment of the urban bioclimate and the main approaches to improving the comfort of the urban environment for the population. The impact of air pollution on human health.

MODULE 3. MEDICAL METEOROLOGY

Multifactorial impact of the natural environment on humans and the use of complex biometeorological parameters to assess the level of comfort of the environment for human life. The main meteorological and helio-geophysical factors affecting the human body, problems of medical meteorology and the possibilities of using space and terrestrial weather forecasts to prevent morbidity of the population. Methods for reducing the probable meteorological reactions of the human body.

2. “Resilience actions to counteract the effects of climate change and emergencies in cities: the role of artificial neural networks”

Maria Cristina Mammarella (Formerly at the Agenzia Nazionale per le Nuove Tecnologie, l'Energia e lo Sviluppo Economico Sostenibile /ENEA, Rome, Italy),

The results of the Istituto Superiore di Sanità (ISS) 2018 “Health and Climate Change” project are presented within the framework of the WHO recommendations (“Climate and Health Council Profile Project” 2015) on the experience of using artificial neural networks (ANN) in complex and dynamic areas such as cities, as tools for managing and optimising actions to increase the resilience of European cities. An example of the use of ANN to improve the effectiveness of local health systems aimed at adapting to and counteracting the impact of climate change (CC) on the most vulnerable people and the environment. At the current level of knowledge,

ANNs have proven to be the most advanced and global solution for coordinating and managing a set of actions to improve sustainability in urban areas.

This course will be useful for students interested in basic knowledge of urban biometeorology, as well as the possibility of using the Internet of Things to improve the comfort of the urban environment.