Course Annotation
Course Title: **Ecology of Urban Systems**
Credits: 6 (216 h.)

Course objective
Study of the criteria of evaluation cities as socio-urban-ecosystems in order to improve the quality of the urban environment.

Course task
Introduction to the methods of solving urban environmental problems on the basis of the interdisciplinary environmental approach that combines social, medical, biological and applied sciences and practices.

Course main chapters
Urboecology, urbo-geo-socio-ecosystems, urbanization. Climate and energy problems of urban territories. Components of the urban geological environment. Dangerous urban geological processes and preventive measures. Water bodies in urban areas and sources of their pollution. Centralized and decentralized water supply. Sewerage system and waste water treatment. Features of the urban air. Sources and control of air pollution in cities. Unfavourable physical influence in urban areas. Influence of the fuel and energy complex on environmental components and human health in urban areas. Alternative energy sources. Characteristics of urban flora and fauna. Phytomeliorative vegetation features and principles of green space in urban areas. Domestic and industrial wastes of cities. Negative influence of the urban environment on the population health. Indoor environment. Environmental problems of urban transport and ways of solutions. Rationing of pollution of the urban environment. Environmental monitoring of the urban territories. Elements of environmental management and urban audit. Ecological, legal and market methods motivating nature conservation activities in urban environment.

Learning outcomes
After attending the course students will be able to:
- characterize the differences in the functioning of natural ecosystems, agrobiocenoses and urboecosystems;
- analyze the natural and spatial resources of the city, state of the urban air, drinking water, surface water bodies, soils, flora and fauna;
- analyze urban meso-and micro-climatic conditions, meteorological data, hydrological and soil-chemical studies in urban areas;
- analyze the features of the location of industrial enterprises, urban transport systems and develop recommendations to optimize the environment;
- calculate the resource requirements for different urban systems functioning develop the appropriate urban environmental planning;
- identify hazards to plants and animals on the urban territories;
- calculate the volume of household and industrial solid wastes and create the scheme for recycling wastes in urban areas;
- analyze the processes of migration and state of population health according to medical statistics;
- provide a comprehensive description and recommendations to optimize the urban environment.

Teaching methods used:
- lectures and practical training sessions.

Final assessment of student's knowledge and practical skills is **examination**.

Head of the Ecology Department,
Professor   **A.I. Gorova**