

Course Summary

Course Title: **GEOINFORMATION TECHNOLOGIES IN ECOLOGY**

Credits: 4 (144 h.)

Course objective

Acquisition of theoretical knowledge and practical skills in the use of geographic information technologies in the field of ecology and environmental protection.

Course tasks

Introduction to the methods of the qualitative and quantitative characteristic description and display of environmental phenomena, objects, and problem situations on the basis of electronic maps that are important for right managerial decision making.

Course outline

The concept of the geographic information system (GIS) and mapping elements. Hardware and information organization in the GIS. Subject information and databases. GIS as a tool for decision-making and application in ecology. The main stages of problem solving of environmental monitoring in GIS at different levels. The concept of Earth remote probing.

Basic operations of MapInfo program. On-site GIS creation. Taking aerial photographs. Working with perspectives and GIS control of aerial photography. Editing the attributes of objects in the database, as well as their topology and geometry. Data import into the GIS, the subtype and attribute domains creation, the geometric modelling. Creation of annotations, layers in the geographic database and topology. Mastery of operations for getting new information. Exports of thematic maps and data to various electronic forms.

Learning outcomes

After completing the course students should be able to:

- apply the geographic information technologies in different spheres of the environmental condition management, determine the structure of the GIS and its main components;
- analyze monitoring data and create a geographic database;
- represent the results of monitoring observations in the GIS;
- analyze the object location, the distribution of the indices and environment spatial changes caused by air pollution, water and soil contamination using satellite snapshots;
- operate the MapInfo program for GIS creation;
- take the snapshots using such programs as Google Earth and SIS Planet;
- execute GIS control of aerial photography;
- edit the attributes of objects in the database, their topology and geometry;
- import the geographical data to the database, create GIS subtypes and attribute domains;
- create the annotation about data layers in the geographic database and topology;
- receive new information in the GIS;
- export thematic maps and GIS data in other electronic formats.

Training activities: lectures and laboratory training sessions.

End-of-the-term assessment: test.

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