

## **Course Summary**

### **Ecological Biotechnology**

**Course duration:** 4.5 ECTS credits (162 hours).

### **Course objective**

Mastering theoretical knowledge and practical skills in the use of biotechnological methods in environmental protection measures for solving current environmental problems of industrial enterprises and technogenic territories.

### **Course tasks**

Understanding the environmental direction of biotechnological processes in different branches of national economy and expediency of their use for the protection of the environment.

### **Course outlines**

History of biotechnology, basic concepts, objects and the subject of biotechnology. Connections of biotechnology with different branches of national economy. Methods and objectives of biotechnology. Advantages and disadvantages of biotechnology methods. Regulatory basis of environmental safety of biotechnological productions. Industrial use of biotechnology in the environmental protection activities. Methods of bio-treatment of industrial wastewater. Biotechnology of obtaining the energy resources from the phytomass. Schemes of biogas and biofuel production. Environmental benefits of using ethanol and biodiesel fuel. Biotechnological processing of minerals (extraction of metals from ores). Biotechnological analytical systems (biosensors) and their use. Biotechnology in the agricultural complex (biological products, bio-fertilizers). Biotechnological transformation of industrial wastes. Biotechnological protection of the environment from xenobiotics.

### **Learning outcomes**

After completing the course students should be able to:

- select, under production conditions, the appropriate biotechnological environmental protection method, based on the use of cheap and available raw materials, for the production of safe products.

**Training activities: lectures and practical studies.**

**End-of-the-term assessment: examination.**

**Head of the Ecology Department,**

**Professor A.I. Gorova**