

Course Annotation

Course Title: **Environmental and Technogenic Safety**

Credits: 7 (252 h.), 0.5 (18 h.) course work.

Course objective

The study of the functioning of technical systems as well as natural processes and phenomena as sources of environmental and technogenic hazards.

Course task

Introduction into the basic principles, ways and means of ensuring national security.

Course main chapters

Environmental and technological safety. Content of concepts. Hazards classification. Basic safety criteria. Hierarchy of security objects. Security principals and their authorities. The main threat to the national security in the environmental field. The signs and levels of emergency. Classification and coding of emergencies. Environmental emergencies. Theory of technical systems Reliability. Technical systems failure modes of and causes. Material aging, environmental factors as the cause of failures. Load factors, human error as the cause of failure. Methods of hazard analysis and detection of technical systems failures. Fault tree. The event tree. Classification of emergencies of natural and anthropogenic origin. Earthquake. Hazards of earthquakes and their prognosis. Landslides, their classification. Landslides control of and prognosis. Floods, types of floods. Flood hazards. Hazardous atmospheric phenomena, peculiarity of their formation. Coping with the impact of hazardous weather phenomena. Classification of emergencies of social and political nature. Classification of military emergencies.

Learning outcomes

After attending the course students will be able to:

- Classify the types of environmental hazards according to their origin;
- Systematize industrial facilities in terms of their environmental hazards,
- Classify types of technical systems failures according to their causes;
- Systematize human errors when dealing with technical systems;
- Classify emergency situations of anthropogenic, natural, socio-political and military origin;
- Assess the level of risk in the degree of acceptability;
- Calculate the level of risk to humans in relation to their production activities;
- Decrypt encoded according to the State emergency classifier,
- Determine the level of an emergency situation by the criteria of its territorial spreading, economic losses and number of victims,
- Determine the reasons for declaring the territory of Ukraine of an ecological zone situation,
- Set a source of environmental threats to the objects according to the level of security to analyze the causes of hazards and identify the causes of failures of technical systems by fault tree and event tree.

Teaching methods used:

- lectures and laboratory training sessions.

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

**Head of the Ecology Department,
Professor**

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