Environmental Science	VidZ1006

Credit points	3
ECTS credit points	4.5
Total number of contact hours	**48**
Lectures (hours)	32
Laboratory work (hours	16

Annotation:

The course is aimed at the students of the Academic study programs „Environmental Science" and "Chemistry". Its goal is to provide information about the most actual environmental problems and the ways they could be solved.

Course content:

Environmental science and its development. Environmental systems. Humans and environmental systems. Global environmental problems. Solutions in environmental protection.

Results:

Students who complete the course successfully will obtain:

- conceptual understanding about the Earth as a system and its main components, as well as about the turnover of matter and energy in nature;
- basic knowledge about interaction between environment and society, main environmental problems, their causes and solutions;
- practical skills in analysation and systematization of information about environmental status of the study area and its influencing factors;
- teamwork experience in analysis of different environmental problems and situations and searching for solutions in environmental protection.

Course plan:

Course structure: lectures - 32 h., practical works – 16 h.

Lectures:

1. Introduction to environmental science. Environment, its deginition and meaning. Environmental science, its research object and relation to other sciences. Subdisciplines of environmental science.
2. History of interaction between society and environment. Environmental awareness, its origins and development in the world and in Latvia.
3. The *Gaia* theory, its origins, main theses and future scenarios. Ecosystem services.
4. The Earth as a system, its subsystems and ther interactions. Feedback effects.
5. Turnwer of energy and matter in nature. Biogeochemical sysles un human impact.
6. Environmental degradation, its causes and effects. Ecological footprint, its calculation principles.
7. Major global environmental problems, their causes.
8. Population growth and exploitation of nature resources in the world.
9. Landuse transformation and landscape degradation.

10. Soil degradation and desertification.
11. Urbanisation and related environmental problems.
12. Waste accumulation and environmental pollution.
13. Atmospheric pollution and degradation of the ozone layer.
14. Biodiversity reduction and degradation of ecosystems.
15. The greenhouse effect, global warming and present climate change.
16. Limits of economical growth. Sustainable development, its principles.

Practical works:

1. Calculation of the Ecological Footprint.
2. General characterisation of the selected nature protected area (nature park).
3. Environmental impact assessment of the municipal waste-dump site project.
4. Environmental impact assessment of a small hydroelectric station dam project.
5. Environmental impact assessment of the cellulose production plant project.
6. Environmental impact assessment of the byway project.
7. Evaluation of urban air quality in Daugavpils by using trees as bio-indicators.
8. Long-term change of air temperature in Daugavpils – analysis of historic weather station data records.

Individual studies:

1. Principles of environmental recultivation, solid waste management and waste-water treatment.
2. Principles of nature (biodiversity) protection. Categories of specially protected areas in Latvia.