

COURSE DESCRIPTION

Course code	Course group	Volume in ECTS credits	Course valid from	Course valid to	Reg. No.
APL1003	C	6	2013-06-10	2016-06-10	
Course type			Compulsory		
Course level			I cycle		
Semester the course is delivered			Spring		
Study form			Face-to-face		

Course title in Lithuanian

APLINKOS GEOLOGIJA

Course title in English

ENVIRONMENTAL GEOLOGY

Short course annotation in Lithuanian

Kursas skirtas susipažinti su Žemės planeta (kilme, vidine sandara, dydžiais ir lt.), jos plutos sandara bei sudėtimi, geodinaminiais procesais, geologinių sluoksnių amžiumi ir jo nustatymo būdais, geologinės istorijos etapais, bendrąja stratigrafine skale ir atskirais geologiniais periodais (aplinkos kitimas, paleogeografija, uolienos, fosilijos), geologiniais išteklių ir jų gavybos ir naudojimo poveikiu aplinkai bei pagrindiniais geocheminiais principais.

Short course annotation in English

The aim of the course is to focus on basic properties of Earth (origin, structure and composition of inner Earth and its crust), geodynamic processes, geologic time and methods of its determination, geological history, general stratigraphic scale and geological periods changes in environment, paleogeography, rocks, fossils), geological resources and to understand the environmental consequences of extracting them and to introduce with the main principles of geochemistry.

Prerequisites for entering the course

Basic ecology

Course aim

The objective of this course is to give understanding of fundamentals of geology, geological resources and the environmental consequences of extracting them and to introduce with the main principles of geochemistry.

Links between study programme outcomes, course outcomes and criteria of learning achievement evaluation

Study programme outcomes	Course outcomes	Criteria of learning achievement evaluation
1. Define the main natural and anthropogenic components of the environment, their interaction and impact on the state of the natural environment.	1. To characterize the main properties of Earth.	Characterized Earth origin, the main properties of Earth, crust structure.
	2. To explain the main geodynamic processes.	Explained endogenic and exogenous geological processes.
	3. To describe the geological history.	Described age of Earth layers and geochronology.
	4. To define types of the main minerals and rocks.	Defined properties of minerals and rocks, identified their types.
	5. To explain the main geochemical principles.	Explained the main geochemical principles.
	6. To define geochemical properties of elements.	Defined chemical and physical properties of elements,

		occurrence, use, hazards.
2. Explain the main local, regional and global environmental issues caused by human activity.	7. To characterize geochemical anomalies.	Characterized sources of geochemical pollution and parameters of anomalies.
	8. To assess the technogenic pollution of surface lithosphere layer.	Assessed the technogenic pollution degree of soil and potential hazards.
3. Apply quantitative and qualitative methods for environmental monitoring and assessment of the state of the environment and its anthropogenic changes.	9. To apply geochemical methods.	Applied appropriate and effective geochemical methods according to properties of research object.
5. Summarize the key environmental problems, factors determining them and potential threats to the natural environmental and human health.	10. To characterize environmental consequences of extracting geological resources.	Characterized use tendencies of geological resources and environmental consequences of their extraction.

Link between course outcomes and content

Course outcomes	Content (topics)
1. To characterize the main Earth properties.	Earth origin, shape, size, density, temperature, chemical composition. Earth crust, its geological and geochemical structure and composition.
2. To explain the main geodynamic processes.	Geodynamic processes. Endodynamic processes: sources of Earth internal energy, plate tectonics, magmatism, tectonic movements, fold and fracture. Exogenous processes: weathering, landslides, activities of wind and rivers, activities of sea and lakes, activities of groundwater, snow, ice (glacier), impact of meteorites.
3. To describe the geological history.	Age of Earth layers and geochronology: relative and absolute age, their determination methods. General stratigraphic scale. The main features of geological periods in Lithuania and world.
4. To define types of the main mineral and rock.	Minerals, classification, characteristics, identification. Sedimentary rocks, their characteristics, identification. Rocks in Lithuania.
5. To explain the main geochemical principles.	Thermodynamics and kinetics. Oxidation-reduction reactions. Solubility.
6. To define geochemical properties of elements.	Groups of chemical elements. Chemical bonds, geochemical classification of elements, movement of elements: diffusion, adsorption, rate of reactions. Accumulation and dispersion of chemical elements.
7. To characterize geochemical anomalies.	Geochemical pollution sources and parameters of anomalies. Methodology of geochemical researches and assessment. Collection of samples, main investigation tools, interpretation of methods and data.
8. To assess the technogenic pollution of surface lithosphere layer.	
9. To apply geochemical methods.	Geochemical parameters of environmental condition. Sources of hazardous chemical elements. Location of accumulation and background levels. Legislation for assessment of geochemical pollution, degree of pollution.

10. To characterize environmental consequences of extracting geological resources.	Geological resources. Characteristics, classification and identification of geological resources. Tendencies of extraction in the world. Lithuanian geological resources and environmental consequences of their extraction.
--	--

Study (teaching and learning) methods

Teaching methods: Telling, disquisition, presentation of examples, discussion, practical tasks formulation and explanation, consulting.

Learning methods: tasks solving, information search, literature analysis, presentation preparation.

Methods of learning achievement assessment

Open written test, assessment of tasks solutions, assessment of presentation.

Distribution of workload for students (contact and independent work hours)

Lectures	45 hours
Laboratory work	30 hours
Individual students work	85 hours
Total:	160 hours

Structure of cumulative score and value of its constituent parts

Laboratory works – 23%, presentation – 10%, mid-term – 17%, exam – 50%.

Recommended reference materials

No.	Publication year	Authors of publication and title	Publishing house	Number of copies in		
				University library	Self-study rooms	Other libraries
<i>Main literature</i>						
1.	2013	Motuzas G. Kaip veikia Žemė: geologijos pagrindai.	Mokslo ir enciklopedijų leidybos centras	6		
3.	1999	Lietuvos geocheminis atlasas	Lietuvos geologijos tarnyba	2		
4.	2012	Lietuvninkas A. Aplinkos geochemija.	Technika	21	1	
<i>Additional literature</i>						
1.	2004	Eby N. Principles of Environmental Geochemistry	Brooks/Cole			

Course programme designed by

dr. Gintarė Sujetovienė, dr. A.Kleišmantas