Course Unit Descriptor

Study Programme: Physics

Course Unit Title: Introduction to geophysics

Course Unit Code: F18OG

Name of Lecturer(s): dr Imre Gut

Type and Level of Studies: Bachelor Academic Degree

Course Status (compulsory/elective): obligatory, elective

Semester (winter/summer): Winter

Language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): face-to-face

Number of ECTS Allocated: 6

Prerequisites: None

Course Aims:

Introducing students to the basic materials and composition of the Earth. Understanding the major internal and external processes occurring on the planet as well as their consequences. The primary objective of the course is that the students get clear picture of the dynamic relationship between matter, nature and processes that occur on the Earth.

Learning Outcomes:

Upon completion of the course, students should have developed:

- General skills: following professional literature; ability to analyse and select the most appropriate solutions;

- Subject-specific skills: understanding the specific terminology. Understanding the basic dynamic motion of matter inside the Earth and phenomena that are its consequences. Knowing the elemental composition of the Earth's litosphere. Recognition of fundamental physical principles behind the natural phenomena. Understanding and ability to predict the flow of the processes that follow certain natural events.

Syllabus:

Theory

The structure and driving forces of movement in the Earth's interior. The main tectonic movements and the theory of tectonic plates. Mineralogical composition of the Earth. The formation, movement and crystallization of magma, igneous rocks. Tectonics in rotational systems. Types of tectonic and metamorphic rocks. Seismology: types and propagation of seismic waves, and seismic measuring devices. Seismic models of the Earth's internal structure (Adams-Viliamson, Bulen, PEM). Spherical analysis: gravimetry, shape and magnetic field of the Earth. Exodinamics: basic characteristics of the hydrosphere, the water cycle, rivers and oceans. Exodinamic work of geological forces. The atmosphere and atmospheric phenomena. Water in the atmosphere, clouds. Heat balance of the planet.

Practice

Exercises that follow the course content. Seminar papers on topics that either follow or expand this content.

Required Reading:

1. W. Jacqueline Kious and Robert I. Tilling, *This Dynamic Earth: The storry of Plate Tectonics*, online edition, 1999, http://pubs.usgs.gov/gip/dynamic/dynamic.html
2. Charles C. Plummer, David McGeary, Diane H. Carlson. *Physical geology*,. McGraw Hill, Boston, 2001.
3. Kurt Roth, *Soil Physics Lecture Notes*, University of Heidelberg, 2006.

Weekly Contact Hours:2	**Lectures:**35	**Practical work:**30

Teaching Methods:			
Knowledge Assessment (maximum of 100 points):			
Pre-exam obligations	points	**Final exam**	points
Active class participation	5	written exam	
Practical work	5	oral exam	70
Preliminary exam(s)	10	…….	
Seminar(s)	10		
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			