



## COURSE DATASHEET

<b>Semester:</b>	2014/15/2
<b>Course:</b>	Mineralogy and Petrology
<b>Code:</b>	VEMKFTB143K
<b>Responsible department:</b>	Department of Earth and Environmental Sciences
<b>Department code:</b>	MKFT
<b>Responsible instructor:</b>	dr. Mihály Pósfai

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### Course objectives:

Introduction into crystallography and general mineralogy. Types and properties of the main rock-forming and environmentally important minerals. Introduction to the formation and types of rocks.

### Course content:

1. Mineral definition. The science of mineralogy, history and main lines of current research, literature. Symmetry of crystals in two dimensions: lattices, point and plane groups. 2. Stereographic projections. Symmetry elements in three dimensions. Point groups, Bravais lattices, space groups. 3. Introduction to the study of crystals: fundamentals of diffraction methods. 4. Crystal chemistry, bond types and structures. Cubic and hexagonal close-packing. Cation coordination in ionic crystals. 5. Thermodynamical basics of mineral formation. Minerals from melts and solutions. The Gibbs phase rule. 6. Physical properties of crystals. Anisotropy, relationships between physical properties and symmetry. 7. Formation of igneous rocks (Bowen series, plutonic and volcanic rocks. 8. Classification of igneous rocks on the basis of chemistry and mineralogy. 9. Formation of sedimentary rocks. Physical and chemical weathering and resulting rock types. 10. Formation and main types of metamorphic rocks. 11. Classification of silicate mineral structures. Orthosilicates and their roles in igneous and metamorphic rocks. 12. Sheet silicates and their significance in soils. Framework silicates. 13. Native elements and sulfides. Hydrothermal ores and their significance as earth resources. 14. Oxide minerals. 15. Carbonate, phosphate, sulphate, halogenide and other minerals. Biogenic minerals.

### Requirements, evaluation and grading:

Grading is based on two written tests during the semester. Participation at practical sessions is mandatory.

### Required and recommended readings:

Hartai Éva: A változó Föld (Miskolci Egyetemi Kiadó, 2003) Szakáll Sándor: Ásványrendszertan (Miskolci Egyetemi Kiadó, 2005) Török Ákos: Geológia mérnököknek (Műegyetemi Kiadó, 2007) Szakmány György: Kőzettan (ELTE Kőzettan-Geokémiai Tanszék, 2003)