BACHELOR'S DEGREE
GEOCHEMISTRY
2ND YEAR OF STUDY, 2ND SEMESTER

COURSE TITLE	IGNEOUS PETROLOGY
COURSE CODE	31020030020SL1112223
COURSE TYPE	full attendance
COURSE LEVEL	1ST cycle (bachelor's degree)
YEAR OF STUDY, SEMESTER	2nd year of study, 2nd semester
NUMBER OF ECTS CREDITS	6
NUMBER OF HOURS PER WEEK	4 (2 lecture hours + 2 seminar hours)
NAME OF LECTURE HOLDER	Assistant Professor Andrei Buzatu
NAME OF SEMINAR HOLDER	Assistant Professor Andrei Buzatu
PREREQUISITES	Mineralogy

A GENERAL AND COURSE-SPECIFIC COMPETENCES

General competences:

→ Effectively using additional scholarly sources and assisted learning resources in order to devise a research paper on a topic pertaining to the academic discipline

Course-specific competences:

→ Identifying, describing and defining the main groups of igneous rocks in relation to the geological processes that generate them

→ Appropriately using the instrumental methods necessary for the quantitative and qualitative evaluation of igneous rocks

→ Appropriately employing the information acquired so as to explain and interpret the igneous processes involved in rock formation

B LEARNING OUTCOMES

Upon completing the discipline, students become capable of:

→ describing the main groups of igneous rocks and the minerals that enter their composition;

→ explaining the genesis of igneous rocks

→ using petrogenetic diagrams

→ analyzing igneous rocks both macroscopically and microscopically

→ calculating mineralogical compositions based on chemical analyses of major elements, so as to use ternary diagrams

→ understanding the building of phase diagrams with 2-3 or 4 components and their role in the study of igneous rocks

C LECTURE CONTENT

Week	Title of lecture	Teaching methods	Duration
1	Introduction. Magmas. The physico-chemical properties of magmas	Lecture based on video projection	4h; Buzgar, 2009; Hall, 1996

	2	The evolution of magmas: the differentiation between crystal-liquid, liquid-liquid and liquid-vapors	Lecture based on video projection	4h; Buzgar, 2009; Hall, 1996
	3	Magma consolidation. Experimental systems with 2 components	Lecture based on video projection	4h; Buzgar, 2009; Hall, 1996
	4	Magma consolidation. Igneous systems with 3 components	Lecture based on video projection	6h; Buzgar, 2009; Hall, 1996
	5	Magma consolidation. Igneous systems with 4 components	Lecture based on video projection	1h; Buzgar, 2009; Hall, 1996
	6	The influence of pressure upon magma crystallization	Lecture based on video projection	3h; Buzgar, 2009; Hall, 1996
	7	Igneous ores	Lecture based on video projection	3h; Buzgar, 2009; Hall, 1996
	8	The systematics and nomenclature of igneous rocks	Lecture based on video projection	3h; Buzgar, 2009; Hall, 1996

D RECOMMENDED READING FOR LECTURES

Main references:

Buzgar N. (2009) *Petrologie magmatică.* Ed. Tehnopres, Iași.
Hall A. (1996) *Igneous Petrology* (2nd ed.). Prentice Hall, Harlow.

Additional references:

Carmichael I. S. E., Turner F. J., Verhoogen J. (1974) *Igneous Petrology*. McGraw-Hill, New York.
Clarke D. B. (1993) *Granitoid Rocks*. Chapman & Hall, London.
LeMaitre R. W. (ed.) (1989) *A Classification of Igneous Rocks and Glossary of Terms: Recommendations of the International Union of Geological Sciences, Subcommission on the Systematics of Igneous Rocks*. Cambridge University Press, Cambridge.
Pitcher W. S. (1997) *The Nature and Origin of Granite* (2nd ed). Chapman & Hall, London.
Winter D. J. (2001) *An Introduction to Igneous and Metamorphic Petrology*. Prentice Hall, New Jersey.

E SEMINAR CONTENT

Week	Title of seminar	Teaching methods	Duration
1	Minerals in igneous rocks	Video projection, observation/analysis of thin sections	2 hours; electron microscope
2	The structure of igneous rocks	Video projection, observation/analysis of thin sections	2 hours; electron microscope
3	The granite family	Video projection, observation/analysis of thin	2 hours; electron microscope and samples

			sections and samples	
	4	The granodiorite family	Video projection, observation/analysis of thin sections and samples	2 hours; electron microscope and samples
	5	The diorite-andesite family	Video projection, observation/analysis of thin sections and samples	2 hours; electron microscope and samples
	6	The syenite-trachyte family	Assessment based on thin sections and samples	2 hours; electron microscope and samples
	7	The basalt-gabbro family	Video projection, observation/analysis of thin sections and samples	2 hours; electron microscope and samples
	8	The foid-bearic syenite-phonolite family	Video projection, observation/analysis of thin sections and samples	2 hours; electron microscope and samples
	9	Fieldwork	Observation/analysis of samples in the field	2 hours; macroscopic samples
	10	Fieldwork	Observation/analysis of samples in the field	2 hours; macroscopic samples
	11	Fieldwork	Observation/analysis of samples in the field	2 hours; macroscopic samples
	12	The foidite-pholidolite family	Observation/analysis of thin sections and samples	2 hours; electron microscope and samples
	13	Ultrabasic rocks	Observation/analysis of thin sections and samples	2 hours; electron microscope and samples
	14	Calculation of QAP parameters. Tectono-magmatic diagrams	Lecture and case studies	2 hours; geochemical diagrams

F	RECOMMENDED READING FOR SEMINARS
	Buzgar N. (2009) *Petrologie magmatică.* Ed. Tehnopres, Iași. **Hall A. (1996)** *Igneous Petrology* (2nd ed.). Prentice Hall, Harlow.
G	EDUCATION STYLE
LEARNING AND TEACHING METHODS	Lecture based on video projection, observation/analysis of thin sections and samples, case studies
ASSESSMENT METHODS	Continuous assessment (35%) and exam (30%) (lecture) – 65%, continuous assessment and paper presentation (seminar) – 30%
LANGUAGE OF INSTRUCTION	English