Academic course description – igneous petrology

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| Bachelor’s DEGREE**GEOCHEMISTRY**2nd YEAR OF STUDY, 2ND SEMESTER |

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| **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
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| 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** |
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| 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 |

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| 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** |
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| 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 sections and samples | 2 hours; electron microscope 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  |

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| 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  |