Academic course description – systematic MINERALOGY

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| Bachelor’s DEGREE**GEOCHEMISTRY** 2nd YEAR OF STUDY, 1st SEMESTER |

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| **Course title** | | **SYSTEMATIC MINERALOGY** |
| Course code | | 31020030020SL1112115 |
| Course type | | full attendance |
| Course level | | 1ST cycle (bachelor’s degree) |
| Year of study, semester | | 2nd year of study, 1st 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 Ionuț Apopei |
| Name of seminar holder | | Assistant Professor Andrei Ionuț Apopei |
| Prerequisites | | Crystallography, Basic 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 classes of minerals in relation to the processes that generate them * Properly using specific instrumental methods for the identification and analysis of minerals * Using the knowledge acquired so as to explain and interpret the processes responsible for the genesis and properties of minerals | |
| B | **Learning outcomes** | |
|  | Upon successfully completing the discipline, students become capable of:   * describing the main classes of minerals * explaining their properties * using polarized optical microscopy * analysing an unknown mineral macroscopically and microscopically * understanding the chemistry and properties of rock-forming minerals so as to have the minimum background necessary for the comprehension of igneous, metamorphic and sedimentary processes and rocks | |
| C | **Lecture content** | |
|  | |  |  |  |  | | --- | --- | --- | --- | | Week | Title of lecture | Teaching methods | Duration | | 1 | Introduction. Systematics of minerals | Lecture based on video projection, heuristic conversation | 2 hours; Deer et al., 1992; Wenk and Bulakh, 2004. | | 2 | Silicates. Subclass: nesosilicates | Lecture based on video projection, heuristic conversation | 2 hours; Deer et al., 1992; Wenk and Bulakh; 2004, Mureșan and Benea, 2000 | | 3 | Silicates. Subclass: sorosilicates | Lecture based on video projection, heuristic conversation | 2 hours; Deer et al., 1992; Wenk and Bulakh; 2004, Mureșan and Benea, 2000 | | 4 | Silicates. Subclass: cyclosilicates. Subclass: inosilicates – pyroxenes | Lecture based on video projection, heuristic conversation | 2 hours; Deer et al., 1992; Wenk and Bulakh; 2004, Mureșan and Benea, 2000 | | 5 | Silicates. Subclass: inosilicates – amphiboles | Lecture based on video projection, heuristic conversation | 2 hours; Deer et al., 1992; Wenk and Bulakh; 2004, Mureșan and Benea, 2000 | | 6 | Silicates. Subclass: phyllosilicates | Lecture based on video projection, heuristic conversation | 2 hours; Deer et al., 1992; Wenk and Bulakh, 2004, Mureșan and Benea, 2000 | | 7 | Silicates. Subclass: tectosilicates | Lecture based on video projection, heuristic conversation | 2 hours; Deer et al., 1992; Wenk and Bulakh, 2004, Mureșan and Benea, 2000 | | 8 | Sulphates and phosphates | Lecture based on video projection, heuristic conversation | 2 hours; Deer et al., 1992; Wenk and Bulakh, 2004, Mureșan and Benea, 2000 | | 9 | Carbonates | Lecture based on video projection, heuristic conversation | 2 hours; Deer et al., 1992; Wenk and Bulakh, 2004, Mureșan and Benea, 2000 | | 10 | Halogens | Lecture based on video projection, heuristic conversation | 2 hours; Deer et al., 1992; Wenk and Bulakh, 2004, Mureșan and Benea, 2000 | | 11 | Oxides and hydroxides | Lecture based on video projection, heuristic conversation | 2 hours; Deer et al., 1992; Wenk and Bulakh, 2004, Mureșan and Benea, 2000 | | 12 | Sulphides and sulphosalts | Lecture based on video projection, heuristic conversation | 2 hours; Deer et al., 1992; Wenk and Bulakh, 2004, Mureșan and Benea, 2000 | | 13 | Sulphides and sulphosalts | Lecture based on video projection, heuristic conversation | 2 hours; Deer et al., 1992; Wenk and Bulakh, 2004, Mureșan and Benea, 2000 | | 14 | Native elements | Lecture based on video projection, heuristic conversation | 2 hours; Deer et al., 1992; Wenk and Bulakh, 2004 | | |
| D | **Recommended reading for lectures** | |
|  | **Main references:**   * Deer W. A., Howie R. A., Zussman J. (1992) - *An introduction to the rock-forming minerals*, 2nd edition. Longman Scientific and Technical, London, 696 p. * Mureșan I., Benea M. (2000) - Mineralogie sistematică. Partea I-a. Ed. ETA Cluj-Napoca. * Mureșan I., Benea M. (2001) - Mineralogie sistematică. Silicați naturali. Partea a II-a. Ed. Casa Cărții de Știință, Cluj-Napoca. * **Wenk Hans Rudolf, Bulakh Andrei (2004) - *Minerals. Their constitution and origin.***   Cambridge University Press, 646 p.  **Additional references:**  **Websites:** www.webmineral.com; www.ima-mineralogy.org;  **Journals:** *American Mineralogist*; *Canadian Mineralogist*; *Elements*, *Mineralogical Magazine, European Journal of Mineralogy*, *Mineralogy and Petrology*, *Physics and Chemistry of Minerals*, *Reviews in Mineralogy* | |
| E | **Seminar content** | |
|  | |  |  |  |  | | --- | --- | --- | --- | | Week | Title of seminar | Teaching methods | Duration | | 1. | Revision: optical properties determined using parallel nicols | Identification under the petrographic microscope | 2 hours | | 2. | Revision: optical properties determined using parallel nicols | Identification under the petrographic microscope | 2 hours | | 3. | Revision: optical properties determined using crossed nicols | Identification under the petrographic microscope | 2 hours | | 4. | Revision: optical properties determined using crossed nicols | Identification under the petrographic microscope | 2 hours | | 5. | Minerals from the silicate class, subclass nesosilicates (olivine, garnets, zircon, titanite) | Observation/analysis of thin sections and observation of samples | 2 hours | | 6. | Minerals from the silicate class, subclass nesosilicates (andalusite, disten (kyanite), sillimanite, staurolite) | Observation/analysis of thin sections and observation of samples | 2 hours | | 7. | Minerals from the silicate class, subclass sorosilicates and cyclosilicates (epidote, zoisite (saualpite), beryl, tourmaline) | Observation/analysis of thin sections and observation of samples | 2 hours | | 8. | Minerals from the silicate class, subclass inosilicates (pyroxenes) | Observation/analysis of thin sections and observation of samples | 2 hours | | 9. | Minerals from the silicate class, subclass inosilicates (amphiboles) | Observation/analysis of thin sections and observation of samples | 2 hours | | 10. | Minerals from the silicate class, subclass phyllosilicates (micas, chlorites, clay minerals) | Observation/analysis of thin sections and observation of samples | 2 hours | | 11. | Minerals from the silicate class, subclass tectosilicates (quartz and feldspar) | Observation/analysis of thin sections and observation of samples | 2 hours | | 12. | Visit to the Mineralogy Museum | Debate | 2 hours | | 13. | Examples of carbonates, sulphates, phosphates, halogens, oxides and hydroxides | Observation/analysis of thin sections and observation of samples | 2 hours | | 14. | Minerals from the silicate class (revision) | Observation/analysis of thin sections and observation of samples | 2 hours | | 15. | Oral exam |  | 2 hours | | |
| F | **Recommended reading for seminars** | |
|  | * Fleischer M., Wilcox R. E., Matzko J. J. (1984) - *Microscopic Determination of the Nonopaque Minerals.* U. S. Geol. Survey Bull., 1627, Washington, 453 p. * Deer W. A., Howie R. A., Zussman J. (1992) - *An introduction to the rock-forming minerals*, 2nd edition. Longman Scientific and Technical, London, 696 p. | |
| G | **Education style** | |
| learning and teaching methods | | Lecture based on video projection, heuristic conversation, observation, analysis, debate |
| assessment methods | | Written exam (35%) and continuous assessment (35%) (lecture-70%), oral exam and continuous assessment (seminar) – 30% |
| Language of instruction | | English |