

Description of the course/module

Organization (institution): KSTU
Course Title: Advanced Geoinformation Technologies in Mining
Target Group: PhD Students (Mining)
Type (Required/Optional): Required Part
ECTS credits allocated (if applicable); estimated workload: 5 ECTS (150 academic hours)
Form of education (full-time / distance learning, etc.); number of classroom hours: 45 hours (full-time hours)
Teaching language: Kyrgyz/Russian/English
Prerequisites and related requirements (if applicable): aerial photography and remote sensing, spatial data science, geographic information systems, an introduction to geospatial programming, rock movement, knowledge of English for reading literature.
Course Objectives: In this course they study: Specialized mountain programs , composition and structure geoinformation systems, their classification and functionality , creation of databases , geostatistics and assessment of field reserves , software packages for geology, mining planning with their optimization, construction and analysis of digital mine surveying plans for production needs , design of ore warehouses and dumps, planning of mining, quarries , equipment and workforce management , production drawings , blast design , pit optimization, scheduling, ventilation, geomechanics, ecology, etc.
Learning outcomes: The student will be able to: LO 1: Use software products in the field of mining, calculation of mineral reserves, geostatistics, pit optimization; LO 2: Construction and analysis of digital mine surveying models, creation of working drawings to solve production needs, develop models of underground mine workings, evaluate the reliability of constructed workings using modern methods and tools for analyzing information; LO 3: Design a drilling and blasting passport using GIS technologies and process their results; LO 4: Perform pit optimization, scheduling, ventilation design.
Course content: 1. Basic concepts, terminology, goals and objectives, composition and structure geoinformation systems, their classification and functionality ; 2. Types and methods of the process of planning and optimizing open pits; 3. Parameters of construction and analysis of digital mine surveying plans; 4. The use of working drawings in solving problems of quarry optimization; 5. Visualization of the obtained results using GIS technologies.
Recommended or required reading and other learning resources/tools: 1. Lecture materials 2. Course materials will be available through ELMS .

3. Power lecture slides Point are available for download in PDF format from the course website.
4. Electronic resources on lecture topics are available on the course website.
5. Class notes, recent journal articles, and links related to course topics will be referenced and/or circulated during lectures.
6. Texts and reference books on the discipline

Planned training activities and teaching methods:

1. Regular and interactive lectures;
2. Laboratory and computational problems;
3. Individual practical training with materials from mineral deposits;
4. 8. Class discussions .

Methods and evaluation criteria:

1. Midterm Exam (25%)
2. Laboratories and Computing (25%)
3. Discussion/participation in classrooms (10%)
4. Final exam 40%
5. Grades: A, B, C, D, E, Fx, F

Additional information: course teacher - Ph.D., associate professor Umarov T.S., Kazatov U.T.