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Master's Educational Program

Program Title

სამთო და გეოინჟინერია

Mining and geoengineering

Faculty

სამთო-გეოლოგიური

Mining and Geology Faculty

Program Head/Heads

Professor David KUPATADZE

Qualification to be awarded

Master of Mining and Geoengineering

Will be awarded upon completion of at least 120 credits of the educational program

Language of Teaching

Georgian

Prerequisite for Admission to the Program

A person with at least a bachelor's degree or equivalent academic degree, who is enrolled based on the results of the master's exams (general master's examination and examination/s determined by GTU), has the right to study in the master's program.

Exam questions/tests will be posted on the website of the Department of Education of GTU at least one month before the start of the exams, those wishing to enroll in the program must submit a foreign language (English, German, French, Russian) a relevant certificate confirming knowledge at least B2 level or must pass an exam at the GTU examination center.

Enrollment in the program without passing the master's exams is possible according to the rules established by the Ministry of Education, Science, Culture and Sports of Georgia.

Program description

The program is compiled by the European Credit Transfer and Accumulation System (ECTS). At the Georgian Technical University, 1 ECTS credit is equal to 25 hours, which includes both contact and independent work hours. The distribution of credits (ECTS) according to subjects is presented in the curriculum.

The duration of the program is 2 years.

The program includes teaching and research components. 10 ECTS credits are intended for the elective (business communication in a foreign language, theory and practice of sectoral text translation) component; 35 ECTS credits are intended for the compulsory component; 75 ECTS credits for the concentration (a total of three concentrations: 1. "Mineral extraction", 2. "Mining technological processes", 3. "Mineral evaluation"). Each concentration consists of a compulsory component (45 ECTS credits), and 30 ECTS credits are devoted to a research component (execution and defense of a master's thesis).

research component

The research component is evaluated once (execution and defense of the master's thesis - 30 ECTS).

Academic year schedule:

The academic year consists of two semesters, fall and spring. In each semester, the educational process will be conducted according to the order of the rector "On the academic schedule of the semester."

Program Objective

The objective of the Mining and Geoengineering Master's Program

- To provide the student with deep and systematic knowledge in the search, evaluation, extraction and processing of mineral deposits;
- In accordance with the requirements of the labor market, to develop the ability to independently carry out innovative research in the construction of mining enterprises, technologies of open and underground processing of deposits and processing of minerals;
- Develop the ability to find original ways to solve complex problems in the field of mining and extraction using the latest methods and approaches.

Learning Outcomes/Competences (general and professional)

Explains the conditions of formation of deposits, processes of mineral formation, the basic principles of designing mining enterprises, the principles of operation of mining machines and equipment, the importance of their correct selection and operation;

Describes the tasks of searching for mineral deposits, the stages of the search, the peculiarities of processing the deposit in difficult mining-geological and mining-technical conditions, control systems of electrical installations, dynamic processes in shaft lifting installations, innovative technologies for the reconstruction of wells, research processes of mineral enrichment;

Discusses the laws of origin and distribution of mineral deposits, engineering-geological conditions of the research territories, ways to eliminate rock fractures and deformations in the mined space, problems of ore enrichment, projects of safe processing of deposits.

Establishes engineering-geological indicators of solid minerals and different types of soils, technological features of processing disturbed layers, optimal technological schemes of processing, features of electrical equipment management;

Justifies the elements of the sustainability of the quarry and deposit, the impact of natural and technical factors affecting them, the mineralized areas and the possibility of their prospects;

Calculates the parameters of separate processes of underground and open mineral processing technology in difficult mining-geological conditions, reserves of mineral deposits, basic parameters for drilling holes, productivity of quarry on mineral and dissolution, mechanical characteristics of engines;

Determines the main factors causing dangerous geological processes, the methodology of geological exploration, the stress-deformed state in the Kanta massif during mineral processing, the influence of the curvature of the quarry board on the stability of the slope, the properties of mineral raw materials, the properties of the mineral components that make up the mineral, modern methods of mineral processing in difficult mining-geological conditions. ;

Predicts the need for re-exploration of previously explored and exploited deposits, mineralized areas and their prospects, hydrogeological and engineering-geological conditions of the environment, static and dynamic conditions of mining machines, opportunities for development of mining technology in difficult mining-geological conditions;

Shares the norms established in the professional field and approved by the state,

Formulates his own opinion and business proposals, both orally and in writing.

In relation to the learning outcomes of the program, by overcoming the groups of subjects focused on a connected topic, the learning outcomes of each concentration are concentrated in the following narrow direction:

Concentration 1 - mineral extraction.

describes the features of deposit opening, preparation and processing, the main processes of working and amortized wells reconstruction; considers safety measures in the implementation of underground mineral processing technology; the rupture and deformations of the ceiling rocks in the extracted space and ways of their elimination, issues of drainage of quarry fields;

mining-geological and mining-technical factors affecting the manifestation of mining shocks; determines the management of the tense and deformed state in the rock massif during mineral processing; types of mechanization in underground and open mining of minerals; in connection with the transition to new capacities, technological issues of construction of depreciated underground structures, existing mining enterprises; Modern methods of mineral processing in difficult mining-geological conditions.

Concentration 2 - mining technological processes.

describes the efficiency of the gravity and flotation process; process of management of mining electric traction electric installations; the process of technological design of ore and solid fuel mineral enrichment factories; considers the placement of the lifting device in relation to the well; established and transitional processes of the automatic management system of the managed technological process; norms and schemes of technological design of enrichment factories; determines the physical and physico-chemical properties of the mineral components of the mineral; the structure of automatic management systems of preparatory and separation processes of mineral enrichment; plans the research process for the enrichment of specific minerals; the sequence of the process of technological design of mineral enrichment factories; Establishes the technological scheme of the solid fuel enrichment plant.

Concentration 3 - mineral evaluation.

describes the tasks of prospecting and prospecting for mineral deposits; the methods of industrial-economic assessment of the deposit, conditions, variability of melting, reserves report; search stages, systems, methods and technical means; the role of tectonic and neotectonic processes in the formation of the engineering-geological conditions of the territories; discusses the systematics of ore and vein minerals and types of contouring of ore bodies; the main regional and zonal factors of formation of engineering-geological conditions of the research areas; determines the main geological factors of the origin and distribution of deposits, geological structure, size, shape, composition, structure of ore bodies; the main factors causing dangerous geological processes; Exploitative search methodology.

Methods of achieving learning outcomes (teaching-learning)

- Lecture Seminar (group work) Practical Laboratory Practice
 Course work/Project Master's Thesis Consultation Independent work

In the learning process, depending on the specifics of a particular study course program, the following activities of the teaching-learning methods are used, which are outlined in the relevant study course programs (syllabi):

discussion/debate; collaborative work; demonstration; induction, deduction; analysis; synthesis; verbal or oral; written work; explanation; action-oriented learning, project development and presentation.

Student's Knowledge Assessment System

The student's knowledge is assessed on a 100-point scale.

The evaluation system allows:

a) Five Positive grades:

- (A)-Excellent - 91-100 points;
- (B)-Very Good – 81-90 points;
- (C)-Good – 71-80 points;
- (D)-Satisfactory – 61-70 points;
- (E)-Sufficient – 51-60 points.

b) Two Negative grades:

- (FX) - Failed to pass – 41-50 points, which means that the student needs more work to pass and is allowed to take an additional exam once with independent work;
- (F) - Failed - 40 points or less, which means that the work done by the student is insufficient and he/she will have to study the subject again.

In case of receiving FX in the component of the educational program, GTU is obliged to schedule an additional exam at least 5 days after the announcement of the results of the final exam.

The grade obtained on the additional exam is the final grade and is reflected in the final grade of the educational program component. Taking into account the evaluation received on the additional exam, in case of receiving 0-50 points in the final evaluation of the educational component, or if the student fails to pass the minimum competence threshold on the final/additional exam, the student will be assigned an F-0 score.

Fields of Employment

Masters of mining and geoenvironmental engineering with appropriate qualifications will be able to work in: mining and processing enterprises; "Industrial Group of Georgia" LLC; "Saknakhshiri" LLC; "Georgianmanganese" LLC; JSC "RMG COOPER"; "RMG GOLD" LLC; "Geoengineering" LLC; LEPL Grigol Tsulukidze Mining Institute; Ministry of Environment Protection and Agriculture of Georgia; Ministry of Energy of Georgia; Ministry of Economy and Sustainable Development of Georgia.

Opportunities for continuing education

PhD educational programs

Human and material resources needed to implement the program

The program is provided with adequate human and material resources. For additional information, please find the attached documentation

Number of attached syllabi – 41