



საქართველოს ტექნიკური უნივერსიტეტი
GEORGIAN TECHNICAL UNIVERSITY

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Bachelor's Educational Program

Program Title

ნავთობისა და გაზის ტექნოლოგიები

Oil and Gas Technology

Faculty

სამთო - გეოლოგიური

Mining and Geology Faculty

Program Head

Professor Nani KHUNDADZE

Qualification to be Awarded and the Extent of the Program in terms of Credits

Bachelor of Oil and Gas Technology

will be awarded by combining at least 230 credits of the educational program's primary specialty and no more than 10 credits of free components if 240 credits are completed.

Language of Teaching

Russian

Prerequisite for Admission to the Program

Only the holder of a state certificate confirming complete general education or an equivalent document enrolled in accordance with the procedure established by Georgia law, shall have the right to study at the Bachelor's Educational Program.

Program Description

The program is based on the ECTS system; 1 credit is equal to 25 hours, which includes both contact and independent work hours. The distribution of credits is presented in the program. The duration of the program is 4 years (8 semesters) and includes 240 credits.

The learning process for each year lasts two semesters for 40 weeks (20 weeks in the first semester, 20 weeks in the second semester) and is outlined as follows: 15 weeks. The learning process, one week, namely VIII week is intended for mid-semester assessment. 16 weeks are total (I-XVI weeks). XVII Documentary Delivery, from XVIII to XX weeks the final and additional exams are held. Additional exam is possible 5 days after the final exam and only if the student did not receive 51 points and the subject was not considered to have been delivered, however at the same time it is necessary to have accumulated 41 points in order to have a chance to take an additional exam.

17 credits out of 60 credits for the first academic year are dedicated to the Relevant fields of studying courses, and the remaining 43 credits for general subjects. Math is taught in two semesters (5-5 credits), an elective foreign language in two semesters (5-5 credits), Physics in two semesters (4-4 credits). In the first semester: General Chemistry Course (3 credits), Information Technology (3 credits), Elective education course in humanitarian sciences (3 credits), basics of Geology (6) are taught.

In the second semester: Computer Engineering Graphics (3 credits), Electrical Equipment and Basics of Electronics (3credits), Basics of Geodesy and Topography (3 credits), mineralogy and petrography (5credits), structural geology and Geological mapping (3 credits) are taught.

For the second studying year 60 credits should be used as: 10 credits in a foreign language, General technical subjects - 9 credits, the remaining 41 credits in the field of relevant, basic studying courses.

For the third studying year 39 credits out of 60 credits are dedicated to basic learning, 18 credits to elective basic education courses, 3 credits - education course "Environmental protection and Ecology".

The fourth studying year 39 credits out of 60 credits are dedicated to basic tuition 11 credits to optional, relevant education courses, and 10 credits to the free component.

Program Objective

- To provide the student with broad knowledge of the search for natural hydrocarbon deposits- exploration, well drilling, field development, oil and gas storage and transportation;
- To develop practical skills in geology, geophysics, geochemistry, drilling, Exploration, processing, production of oil and gas deposits in the direction of transportation and storage.

Learning Outcomes/Competences (general and sectoral)

- **Describes** oil and gas exploration, hydrogeological, geochemical and Geophysical works, well drilling, oil and gas extraction, their deposit processing, oil and gas transportation and storage processes
- **Discusses** safety issues of exploration, drilling, production, transportation and storage processes, oil and gas deposits and the geological structure of deposits, the movement of fluids in different atmosphere, Conditions for the construction of oil and gas pipelines, oil and gas storage facilities, oil and gas issues of effective management of enterprises
- **Determines** the influence of the drilling fluid on the well drilling process, different mining technical and climatic conditions of pipelines and oil Gas storage construction technologies, environmental safety issues in the field of oil and gas technologies
- **Explains** the properties of oil-bearing rocks and fluids, the principles oil and gas regions and regularities of deposit placement in wrinkle systems of oil and features of gas accumulations
- Hydrocarbon exploration, drilling, extraction and transportation processes **uses** geological, geochemical, hydrogeological, geophysical and calculation methods
- With exploration, reconnaissance, hydrogeological, geochemical, geophysical works, by hydrodynamic investigations of wells, Kern analysis **interpret** the results
- **Collects** data of performed works in oil and gas technologies and builds geological models, maps and schemes
- According to the specific task, **selects** drilling solutions, dimensions of quarry, characteristics of processing modes, methods of hydrodynamic and geophysical studies and necessary tools for the exploitation of wells, optimum parameters, categories of oil and gas reserves and calculations methods.
- **Analyzes** industrial-geological, geophysical, well drilling modes parameters, oil and gas prospects
- **Presents** own opinions/ideas in forms appropriate to the context for oil and gas specialists and non-specialists in the field of technology.

Methods of Achieving Learning Outcomes (teaching-learning)

- Lecture Seminar (group work) Practical Laboratory Practice
 Course work/Project 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 – this is the most widely spread method of interactive teaching. A discussion process greatly increases the quality of students' involvement and their activity. A discussion may turn into an argument and this process is not merely confined to the questions posed by the teacher. It develops students' skills in reasoning and substantiating their own ideas.

Collaborative work - using this method implies dividing students into separate groups and giving each group its own task. The group members work at their issues individually and at the same time share their opinions with the rest of the group. According to the problem raised, it is possible to shift the functions among the group members in this process. This strategy ensures the students' maximum involvement in the learning process.

Demonstration method - this method implies a visual presentation of information. It is quite effective in terms of achieving results. In many cases, it is better to present the material to students

in both audio and visual form simultaneously. The material being studied can be demonstrated by both the teacher and the student. This method helps to make visible the different stages of understanding the learning material, to clarify what students will have to do independently; At the same time, this strategy visualizes the essence of the issue/problem. The demonstration can take a simple form.

Inductive method - determines the form of transfer of any knowledge when, in the process of learning, the course of thought is directed from facts to generalization, i.e., when transferring the material, the process goes from the specific to the general.

Deductive method - determines the form of transferring any knowledge, which is a logical process of discovering new knowledge based on general knowledge, i.e., the process goes from the general to the specific.

Method of analysis - helps to break down the learning material as a whole into its component parts. This facilitates detailed coverage of individual issues within a complex problem.

Synthesis method - involves grouping separate issues into a whole. This method helps to develop the ability to see the problem as a whole.

Verbal or oral method. This method includes lectures, narration, conversation, etc. In the above process, the teacher conveys and explains the learning material through words, and students actively perceive and internalize it by listening, memorizing, and understanding.

Case study - The teacher discusses with the students specific cases and they study the issue in every way and thoroughly.

Brain storming - this method involves facilitating the formation and expression of as many, preferably radically different, opinions and ideas on a particular issue/problem within the theme as possible. The mentioned method stipulates the development of a creative approach to the problem. The use of the method is effective when there are 2 large groups of students and consists of several basic stages: - definition of the problem/issue from a creative point of view; during a certain period of time, uncritical recording of thoughts expressed by listeners on a problem (mostly on the board); - definition of the evaluation criteria to determine whether the idea corresponds to the purpose of the research; - evaluation of the chosen ideas according to predetermined criteria; - through exclusion, to highlight those ideas that are most relevant to the issue; - identification of the idea with the highest score as the best way to solve the problem.

Writing work method - implies the following forms of activity: copying, taking notes, making a synopsis of the material, composing theses, writing an abstract or essay, etc.

Explanatory method - is based on discussing a given issue. In the process of explaining the material, the teacher brings concrete examples, the detailed analysis of which is made in the framework of the given topic.

Activity-based learning - requires the active involvement of the teacher and the student in the learning process, where the practical interpretation of theoretical material is especially important.

Project development and presentation - during the work on the project, the student uses the acquired knowledge and skills to solve a real problem. Project-based learning increases students' motivation and responsibility. The work on a project includes the stages of planning, research, practical activity, and presentation of the results in accordance with the chosen issue. A project is considered to be realized if its results are presented in a clear and convincing manner and in a correct form. It can be done individually, in pairs, or in groups. It can also be done within one subject or within several subjects (subject integration). Once completed, the project will be presented to a wider audience.

Student's Knowledge Assessment System

The student's knowledge is assessed on a 100-point scale. Positive grades are:

- (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.

Negative grades are:

- (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.

Fields of employment

Mining - geological enterprises, oil and gas corporation, oil and gas Exploration, production and transportation companies.

Opportunities for continuing education

Master's degree 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: 80