



**Approved by**  
Resolution № 15 of the joint  
meeting of the Academic  
Council and Senate of GTU  
dated December 16, 2013

**Amended by**  
Resolution № 01-05-04/61  
of the Academic Council of  
GTU dated June 7, 2022

## PhD Educational Program

### Program Title

აგროინჟინერია

Agroengineering

### Faculty

აგარული მეცნიერებების და ბიოსისტემების ინჟინერინგის ფაკულტეტი

Agricultural Science and Biosystems Engineering

### Program Head/Heads

Professor Davit GUBELADZE

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

Doctor in Agro Engineering

is awarded if the educational component of the educational program (60 credits) and the research component are completed. The duration of the program is at least 3 years.

### Language of Teaching

Georgian

### Prerequisite for Admission to the Program

A person who has the qualification of Master or equivalent academic degree (graduate of the detailed field of study area classifier: "Engineering and Practice of Engineering (unclassified)") has the right to study at the PhD educational program. Scientific publications, participation in scientific conferences, and other documents and materials related to educational/research activities (certificates, honorary certificate, patents, etc.) are taken into account.

Those wishing to apply to the program must submit a research project outlining the purpose and direction of the applicant's research, as well as a relevant international certificate confirming English language proficiency of at least B2 level.

In the absence of the above certificate, the applicant shall take the English language exam at the GTU examination center. A PhD candidate graduated from an English-language program (Bachelor's and/or Master's program) is not required to take the exam and present the certificate.

The PhD candidate is interviewed by an interim faculty commission.

The procedure for admission to the doctoral program and admission conditions are posted on the University website.

It is possible to enroll in a program on the basis of mobility twice a year within the deadlines set by the Ministry of Education, Science, Culture and Sport of Georgia, following the mandatory procedures and rules set by the University.

Admission to the program or transfer from a recognized higher education institution in a foreign country is carried out in accordance with the rules defined by the legislation of Georgia.

External mobility. Enrollment in an educational program is also possible on the basis of mobility, in accordance with the order of the Minister of Education and Science of Georgia dated February 2, 2010 No. 10/N "Procedure for Transferring from a Higher Educational Institution to Another Higher Educational Institution".

Internal mobility. The applicants shall also be admitted to the educational program on the basis of internal mobility. The terms and procedure of internal mobility are determined by the legal act of the University and the information is posted on the University website.

The educational program is public and available to all interested parties. The website of Georgian Technical University both in the news field and on the page of the Training Department contains information about the processes and procedures of enrollment in educational programs. Educational programs are posted on the webpage of the Faculty, where anyone can learn about the necessary conditions for admission to the program, as well as its content.

Contact information is indicated on the website of the Training Department and Quality Assurance Service of the University, as well as on the website of the Faculty. All interested persons have the opportunity to get information and advice on any issue, both by phone and by e-mail.

### **Program Description**

The program is compiled using the ECTS system. 1 credit is equal to 25 hours, including contact and independent work hours. The distribution of credits is presented in the program curriculum.

The program lasts at least 3 years (6 semesters). The tasks of the educational component are sectoral and methodological preparation of doctoral students to implement the goals of the educational program of doctoral studies. The educational component helps the doctoral student in the successful preparation of the thesis, in further pedagogical and scientific activity. The educational component of the PhD program consists of 60 credits, as detailed in the program's subject loading.

The second and subsequent semesters provide for the completion of the research components, which include: research project/prospectus, colloquium-1, colloquium-2, colloquium-3, preliminary defense, thesis completion and defense.

## Program Objective

The objective of doctoral program in Agroengineering is to prepare a highly qualified specialist, teacher and researcher with knowledge of modern technologies in accordance with international standards in the field of agroengineering, who will be able to make effective agrotechnical decisions through wide application of theoretical and practical knowledge and results of research works; to effectively carry out reclamation measures for agricultural activities, plan, conduct and analyze multifactorial experiments; who will be able by using modern technologies to solve the issues of maintenance and cultivation of agricultural crops and increase yields; effectively manage water resources, maintain agro-ecological sustainability of agricultural fields, and assess water erosion and flooding processes; to protect agricultural fields from natural hazards and to investigate and scientifically evaluate the necessary problematic issues in this regard; justify the measures taken and put them into practice.

A doctoral graduate is oriented to the labor resources market, is competitive and meets modern requirements.

## Learning Outcomes/Competences (general and professional)

- Knows modern forms of new scientific research methods in agroengineering; modern measures necessary to maintain agroecological balance and necessary conditions for its realization; results of the latest research on sustainability of nature; latest technologies of preventive measures for protection against environmental risks;
- Can develop new modern research and analytical methods, use modern technical achievements, carry out agricultural agrotechnical measures, forecast water erosion processes of soils and ground, determine operational characteristics of systems as a result of independent research; Agro-engineering services based on new principles of modern management; can provide agroengineering services based on new principles of modern management;
- Determines agro-ecological condition of agricultural fields by new approaches; according to modern research, determines the sustainability of agro-ecosystems;  
Evaluates the importance of reclamation systems using the latest approaches; uses new modern approaches and justifies the necessity of agroengineering measures based on the results of independent research;
- Conducts independent research based on new achievements in the field of agroengineering, plans appropriate measures related to soil degradation, taking into account modern approaches determining its causes; manages agromechanization, water erosion studies, and groundwater use for irrigation; ensures removal of excess water in drying areas; engineering calculations necessary to ensure slope stability; manages agricultural use of natural resources, groundwater, reservoirs and rivers and cost-effective management of agricultural operations;
- Assesses the complexity of the agrotechnical condition of the study site using the latest technology, incorporates a forward-looking view of the environmental infrastructure into the discussion of problematic issues; conditions of their location and agricultural use; agroengineering uses modern technological means and devices to protect agricultural fields, prefers the introduction and use of new methodology;
- Makes independent decisions and provides sound recommendations to solve current problems in the field of agroengineering on the sustainability and technical excellence of current processes of agrotechnical measures;

- Utilizes knowledge based on the latest achievements through a combination of teaching and learning methods and takes care of its consolidation and further improvement. During research activities is focused on the latest technological forms of modern research; In analyzing findings, considers appropriate methods and evaluation criteria derived from the research, is able to critically analyze, synthesize, and evaluate new, complex, and controversial ideas and approaches;
- Shares norms of ethical and professional responsibility, presents new knowledge in agroengineering in a sound manner, applies lessons learned from independent research to strategies and concepts emerging from new visions, and demonstrates values of engineering professional behavior: punctuality, objectivity, a commitment to organization and integrity, and respect for the profession;

### Methods of Achieving Learning Outcomes (teaching-learning)

- Lecture  
 Seminar (group work)  
 Practical  
 Laboratory  
 Practice  
 Project  
 Scientific and thematic seminar  
 Independent work  
 Consultation  
 Research component  
 Structure of the thesis  
 Thesis defense

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, case study, induction, deduction, analysis, synthesis, problem-based learning (PBL), oral or verbal work, writing work, explanation, action-oriented learning, project development and presentation, brain storming, defining the problem/issue from a creative perspective, simulative and role-playing games

### Student's Knowledge Assessment System

Assessment is done on a 100-point system.

Assessment of the learning component:

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.

In case of FX, an additional examination is scheduled no later than 5 days after the announcement of the results. The grade received at the additional examination is not summarized with the grade received at the final assessment.

More detailed information is available on the GTU website: Instructions for Managing the Educational Process at Georgian Technical University.

Assessment of the scientific research component(s):

- a) with the highest praise (summa cum laude) - excellent performance;
- b) with great praise (magna cum laude) - result exceeding the requirements in all parameters;
- c) with honor (cum laude) - a result that exceeds the requirements;
- d) satisfactory (bene) - an average level work that meets the basic requirements;
- e) sufficient (rite) - a result that, despite its shortcomings, still meets the requirements;
- f) insufficient - an unsatisfactory level work that cannot meet the requirements due to significant deficiencies in the work;
- g) completely unsatisfactory (sub omni canone) - a result that completely fails to meet the requirements

The research component is evaluated once, at the stage of dissertation defense, with a final grade.

The teaching and research component of the educational program of doctoral studies and the procedure for their evaluation are posted on the University website.

#### **Fields of employment**

Ministry of Environmental Protection and Agriculture of Georgia; Ministry of Regional Development and Infrastructure of Georgia; United Water Supply Company of Georgia; District municipalities - sectoral commissions; JSC Saktskalproekti (Georgian Water Project); Regional service centers of Georgian Amelioration LLC; Vocational and state colleges and institutions of higher education relevant to the field; Nature use facilities and sites of conservation value; Public or private enterprises, institutions and farms, as well as sectoral public/private and non-governmental organizations; scientific organizations; international organizations dealing with agricultural problems, consulting and analytical institutes;

#### **Human and material resources needed to implement the program**

The program is provided with adequate human and material resources.

**Number of attached syllabi: 13**