საქართველოს ტექნიკური უნივერსიტეტი
GEORGIAN TECHNICAL UNIVERSITY

Approved by
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PhD Educational Program

Program Title

სასურსათო ტექნოლოგია
Food Technology

Faculty

აგრარული მეცნიერების და ბიოსისტემების ინჟინერინგი
Faculty of Agricultural Science and Bio-system Engineering

Program Head/Heads

Professor Teimuraz RUKHADZE

Qualification to be Awarded

Doctor in food Technologies
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

Master's degree diploma in food technology, agronomy, veterinary, animal science, forestry, chemical and biological engineering, agricultural engineering, physics, chemistry, biology/life sciences/applied biological sciences or equivalent. 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.

- ✓ Results of the examination results for one of the foreign languages (English, German, French, Russian) to be held at the University testing center or provide an appropriate international certificate.
- ✓ Interview with an interim faculty commission

Applicants educated abroad (who have completed a foreign language program) are not required to take an exam or present a certificate

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 the doctoral program is to provide the student with deep and systematic knowledge in the field of food technology, with the help of which he/she will be able to master new, innovative technologies in food production, independently plan and conduct scientific research, solve technological problems related to the quality of products at the enterprise, ensure the release of competitive products, determine the risks of food production, assess the quality and safety of food products.

Learning Outcomes/Competences (general and sectoral)

(a) Knowledge and Understanding

- possesses knowledge based on the latest scientific advances in food technology that allows for the expansion of knowledge or the use of innovative methods;
- has knowledge based on recent advances in scientific research on food quality and safety;
- has knowledge of the HACCP system of food safety and risk management;
- has knowledge of current antioxidant food additive technologies required for food production;

(b) Ability to apply knowledge in practice

- can identify food products and determine the fact of falsification.
- can independently plan, implement and supervise innovative food technology research;
- can develop new research and analytical methods and approaches aimed at obtaining environmentally friendly and safe food products;
- can seek original ways of solving complex problems and freely use proven methods, including elements of scientific research;

(c) Ability to make conclusions

- is able to critically analyze, synthesize and evaluate new, complex and controversial ideas and approaches in the field of food technology, thus contributing to the design/development of new methodologies;
- is able to independently make correct and effective problem-solving decisions;
- has the ability to prove scientific hypotheses arising from experimental research using logical arguments.
- has the ability to plan experimental work, use and evaluate its traditional and modern methods.

(d) Communication skills

- has the ability to reasonably and clearly present new knowledge in relation to existing knowledge;
- has the ability to conduct polemics on the subject matter with international scientific organizations and scientific community on the basis of seminars, conferences;
- has the ability to effectively use modern computer and communication technologies, as well as libraries and other sources of information.

(e) Ability to learn

- readiness to develop new ideas or processes based on knowledge based on the latest achievements in the process of learning and activities, including research;

(e) Values

- exploring the ways in which values are established and developing innovative methods of establishing them;
- establishing values that ensure the safety, health and well-being of society.

Methods of Achieving Learning Outcomes

☒ Lecture ☒ Practical ☒ Scientific and thematic seminar ☒ Laboratory ☒ Independent work
☒ Research component ☒ Consultation ☒ 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):

1. **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.

2. **Case study** - the teacher discusses specific cases with students and they study the issue comprehensively and thoroughly. For example, in engineering safety it might be a discussion of a specific accident or disaster, in political science it might be a specific issue, such as an analysis of the Karabakh problem (the Armenian-Azerbaijani conflict), etc.

3. **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.

4. **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.

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

6. **Verbal or oral method**. This method includes lecture, 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.

7. **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.

8. **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.

9. **Practical methods** - combines all forms of learning that provide students with practical skills. In this case, the student independently performs this or that action on the basis of acquired knowledge.

10. **Laboratory method** - allows a student to visualize a process more clearly, which enhances the process of perception. In the laboratory, the student learns how to conduct an experiment.

11. **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.

12. **Problem-based learning (PBL)** - a method that uses a specific problem as the initial stage of the process of acquiring and integrating new knowledge.

13. **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.

14. **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.

15. **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.

16. **Action-oriented learning** - requires active participation of the teacher and student in the learning process, where the practical interpretation of theoretical material is of particular importance.

17. **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.

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.

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.

Fields of employment

- Higher educational institutions;
- Scientific-research institutes;
- Food Standardization Service;
- Food expertise and certification bodies.
- Food production enterprises.

Human and material resources needed to implement the program

The program is provided with adequate human and material resources.

Number of attached syllabi: 15