



Joint Master Programme in Natural Sciences of Free University of Tbilisi and Agricultural University of Georgia

Programme Title:

Joint Master Programme in Natural Sciences

Qualification Awarded:

Master's in Biology;
Master's in Chemistry;
Master's in Physics;

Language of Instruction:

Georgian

Programme Credits:

120 ECTS

Concept of the Programme:

Free University Tbilisi (FUT) and Agricultural University of Georgia (AUG) have a vast experience in the development of high quality bachelor's degrees in natural sciences. Many graduates continue to study or work overseas, however, there are also graduates who would like to continue their academic career but can't afford to go abroad.

There are no educational programs in Georgia that provide adequate access to education to an integrated natural sciences program, namely biology, physics and chemistry. Therefore, the joint educational program in natural sciences is partially designed for such persons and aims to provide them with a high standard of educational services.

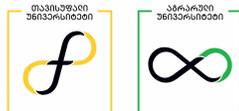
FUT and AUG have unique resources, such as highly qualified professors, material base, financial resources, etc. in the field of natural sciences in order to jointly prepare PhD graduates that will be able to engage in scientific, pedagogical or practical activities.

With joint resources, FUT & AUG can create much better conditions and scientific environment than separately from each other.

While designing this educational program, existing successful models in both United States and in Europe were reviewed and taken into account. Based on these models, we developed a curriculum matching with our goals and potential.

Objectives of the Programme:

The goal of the programme is to prepare Master's in Biology, Chemistry, and Physics, who will be focused on theoretical, as well as on practical activities. Master's in Natural Sciences is oriented on developing necessary general skills of students, which are important on one hand for



continuing scientific work on doctoral level, and on the other hand for a successful career in the modern labour market.

Admission Prerequisites:

To study at the Master's in Natural Sciences Programme, a person must hold a Bachelor Degree. Enrolment to the programme is conducted in accordance with the Georgian legislation.

To be admitted to the Master Programme, the candidate is required to pass the General Master's Exam and internal exams, determined by the university.

Enrolment is also possible through mobility, in accordance with the legislation.

Enrolment at the educational program is also possible without the passing of the General Master's Exams, in accordance with the rule defined by the legislation and the Ministry of Education and Science of Georgia.

Learning Outcomes:

The graduate will have general and specific competencies listed below:

Knowledge and Understanding (Biology):

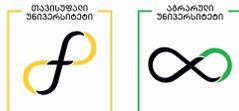
- will acquire principles and peculiarities of immunological research diverse methods;
- will learn how to use laboratory equipment and reagents;
- will know interaction processes of microbes and host organisms;
- will know technology how to prepare vaccines based on microbes against the infections;
- will be able to characterize cell cultures by microscopy and flow cytometry;
- will know genetic engineering and recombinant DNA technologies;
- will possess knowledge of neuroscience research techniques such as brain electroencephalography, microelectronic technique, psycho-physical methods of research, processing and analysis of brain images obtained by magnetic resonance scanning.

Knowledge and Understanding (Chemistry):

- will have deep and systematic knowledge of chemistry sphere;
- will understand and find out solution ways for any problem;
- will be able to follow the trends of the chemistry field development, understand the challenges of chemistry and chemistry engineering through scientific, scientific-popular or other literature;
- will know how to plan and conduct laboratory, experimental researches.

Knowledge and Understanding (Physics):

- will have a deep and systemic knowledge of the physics field that will allow to understand, make critical analyses and use new original ideas;



- will be able to follow the trends of the physics field development, understand the challenges of chemistry and chemistry engineering through scientific, scientific-popular or other literature.

Applying Knowledge to Practice (Biology):

The graduate will be able to:

- plan the procedures, analyse methods, forecast potential results or unplanned events of biology experiments;
- determine malfunction or reactivity of the equipment during the experiment;
- produce of food raw materials, enzymes, recombinant strains of antibiotics;
- develop experimental design of neurophysiological research and conduct experiments independently.

Applying Knowledge to Practice (Chemistry):

The graduate will be able to:

- use theoretical knowledge in practical tasks of chemistry and related fields;
- design, plan, and divide the work and monitor the progress;
- conduct synthesis of chemical compounds and analyses, to determine the structure and cleanliness of unknown substances by using standard methods.

Applying Knowledge to Practice (Physics):

The graduate will be able to:

- use of modern physics methods to solve the fundamental and applied tasks faced by modern physics and its related fields;
- design, plan, and divide the work and monitor the progress.

Ability to Make Conclusion:

- make grounded conclusions bases on the critical analysis of complex and incomplete information (including recent research);
- make innovative synthesis based on the recent data.

Communication Skills:

- perfect academic writing and communication skill on a native language;
- perfect academic writing and communication skill on a foreign (English) language;
- adapt and act professionally in unfamiliar environment;
- use modern information and communication technologies.

Ability to Learn:

- conduct the learning process independently, to understand characteristics of the learning process and make own strategic plan;



- search/analyse/use of information;
- use the sources in original format and make deep and qualitative critical analysis of the information.

Values:

- Graduates will be able to evaluate values and contribute to the establishment of new values. They will have knowledge and understanding of ethical norms while conducting research;
- graduates will have knowledge of basic principles of professional responsibility and professional ethical norms.

Career Options:

Upon completion of the Master Programme in Natural Sciences, graduates will be able to work:

- as a scientist or researcher in private and public projects;
- non-governmental organizations;
- as a consultant in a private and public organizations.

Learning and Teaching Methods:

In order to achieve the learning outcomes of the Master Program, appropriate learning and teaching methods are used. In general, following methods are used:

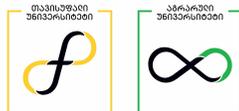
- verbal/oral communication method;
- discussion/debate;
- demonstration method;
- field practice;
- presentation;
- induction, deduction, analysis, synthesis;
- writing work;
- laboratory work

In order to achieve learning outcomes, professor or a person engaged in an educational program is authorized to use one of several methods or any other method to achieve concrete academic research goals.

Within the framework of academic freedom, the lecturer is entitled to specify and use methods that are not included in the programme and/or not use any of the learning and teaching methods from the programme, based on the course content.

Knowledge Assessment System

Student's knowledge is assessed by a score system out of 100 points. The assessment is multicomponent and meets the rules of calculating higher educational program credits,



approved by the Order N3 issued on 5 January 2007 by the Minister of Education and Science of Georgia.

During the assessment of student's knowledge, all the academic staff and any invited personnel are obliged to use the above-mentioned rule. Following scheme is used to assess the knowledge:

1. Five types of positive assessment:

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

2. Two types of negative assessment:

- (FX) Fail to pass – score between 41-50, which means that the student needs to work more and he or she is able to redeliver exam after the independent preparation;
- (F) Fail – score 40 and below, which means that work done by students is not sufficient and he or she must study the course again.

During the assessment of study outcomes forming and summary assessment forms are used.

Study Plan (Curriculum):

Curriculum and semester plan are available. The description of the study components is described in the syllabi.

Human and Material Resources:

Free University employs outstanding academic and invited personnel with successful experience for its educational programmes.

Educational programmes are financially and materially supported. For implementation of the programmes university allocates relevant financial resources. Programmes are also supported materially. Educational programmes are taught at Kakha Bendukidze University Campus, which is equipped with all the necessary inventory and other resources needed for high quality education.