

Approved

By (N(N)LE - Saint King Tamar University of
Georgian Patriarchate
Rector's order
01/1/16, 14.05.2021

**Non-profit (non-commercial) legal entity St. King Tamar
University of
the Georgian Patriarchate**

Graduate Program

Program title: Bio-pharmacy /0916.2.4/

Qualification/academic degree to be awarded: Master of Biopharmacy
/ Master of Biopharmacy

Program volume in credits: 120 (ECTS) Credits

Basic Educational Structural Unit Implementing the Program: Faculty of Biomedical and Natural
Sciences and Healthcare.

The head of the program: Lia Tsiklauri, Doctor of Pharmacy, Professor of St. King Tamar Educational
University of Patriarchate of Georgia

Language of instruction: Georgian

The program purpose is

To train a specialist in the field of bio-pharmacy, who will have deep theoretical knowledge in the main tasks of bio pharmacy - maximum increase in the therapeutic efficiency of medicinal substances and minimization of their side effects; in the fundamental principles of current cellular and molecular pharmacology, in the basis of multiple drug resistance, selective action, and bio penetration of drugs; in target structures and the action of drugs on adaptive response. To teach the pharmacokinetics of drugs in the body, biotransformation processes, and molecular-genetic aspects of pharmacological treatment; Advances in the use of nanotechnologies to improve drug bio penetration. Also to teach current molecular-biological and bioanalytical methods. To deepen the understanding of molecular biology and biochemistry. To deepen the understanding of molecular biology and biochemistry. The program has a scientific research character and gives the perspective of creating new therapies, identifying their mechanisms of action, and putting them into practice.

The Program Admission Preconditions

A person with at least a bachelor's degree or an equivalent academic degree has the right to study for a graduate degree.

The rules for admission, study, and award of a master's degree at the University Faculty are determined by normative acts of the State of Georgia, the University Statute, and the individual-legal act of its Rector.

A person can become a Master's student, if he/she has at least Bachelor's degree or an equivalent academic degree, passes pre-registration at the LEPL - National Center for Assessment and Examinations, passes the General Master's Exam in the field of Master's educational program approved by the Government of Georgia (in the case of exceeding the minimum competence per the rules established by the legislation of Georgia) and based on the positive results of the University exams (specialty - oral and in foreign language (English) - oral). Foreign citizens can become Master's students on the basis of the rules defined by the Ministry of Education, Science, Culture and Sports of Georgia. Subjects of internal University exams and conditions are determined by the level of knowledge required to begin studying the given program. The above mentioned may change according to the quality improvement strategy to achieve the program outcomes, and will be published annually following the established rules. The admission preconditions to the program and other information relevant to the admission is annually placed on the website of the National Assessment and Examination Center, reference book and the website of the University.

The Graduate Program admission preconditions and procedures comply with current legislation, consider the specifics of the program, ensure enrolling of individuals with necessary knowledge, skills and competence to overcome the program, are fair, public and accessible.

Student's learning outcome

a) Knowledge

Has deep and systematic knowledge of the field, which allows developing new, original ideas; understands ways to solve a particular problem; possesses information about various directions of current pharmacy.

Knows the molecular mechanisms of drugs action, the action of compounds of plant, animal, microbial origin or synthetic biologically active compounds, understands the ways of drug entry into the body, including the relationship and curative potential; peculiarities of factors acting on pharmacokinetic and pharmacodynamic processes of drugs, bio-penetration and determination of physic-chemical and technological parameters acting on it; drug resistance and the role of transport proteins in its formation,

the basics of absorption, distribution, metabolism and elimination (excretion) of the active substance in the body.

Knows the principles of application of nanotechnologies in bio-pharmacy and development of modern drug delivery systems; principles of differentiation of poisonous and mighty medicinal substances, prediction of side effects and toxicity and their avoidance. The student possesses current methods of pharmaceutical technology and biochemical research; general systematization of instrumental methods, essence, capabilities, aspects of application. Knows the structure and working principles of the tools used to produce practical work, the algorithm for processing the obtained results, and the specifics of interpretation.

b) Ability: Has the ability to determine and analyze the action of drugs, the mechanism of drug resistance; select a research question and formulate a hypothesis. Can select the necessary research strategy; uses a creative approach to issues; has the ability to manage time and resources efficiently.

Has skills in pharmaceutical technology, working with analytical and bioanalytical laboratory equipment; skills in taking and processing biological samples.

Can carry out research using pharmaceutical technology and current methods of biochemical research; correctly perceive the connection between the chemical structure of the active substance, the drug preparation technology and its pharmacological effect; can take into account the peculiarities of receiving, storing, using, and standardizing raw materials of plant, animal, microbial and synthetic origin. Can independently carry out new original scientific research in the field of bio-pharmacy using optimal methods of solving the set tasks.

The Master of Bio-pharmacy has the ability to predict the development of events in the context of limited information, to draw the right conclusions, to manage changes in dynamics, to form an action ordonnance based on appropriate arguments, and to make efficient decisions. Can form reasoned conclusions based on research results. Has the ability to generate logical thinking, critical analysis, evaluation, and synthesis. Has the ability to formulate an expert opinion if necessary.

Has the ability to communicate scientifically in native and English languages.

Possesses the skills of using current information and communication technologies, taking into account the specifics of the field.

Has the ability to prepare scientific reports and presentations for both specialists and a broad audience.

Can coordinate group activities; obtain and process specific biopharmaceutical-specific professional information from a variety of sources; report to the academic community at the academic level, receive comments, remarks, and advice; express own position on key issues, defend, and actively participate in discussions (both in native and one of the European languages).

c) Responsibility and Autonomy:

The Master of Bio-pharmacy can identify learning needs, and plan and implement learning independently. He / she has the ability to plan, carry out the original research,

interpret the results of laboratory observations and measurements correctly, initiate research in the field of specialization and generate interesting ideas. In addition, the graduate can: Work independently with educational, scientific, normative references, and other sources, critically evaluate the learning process, and prioritize own knowledge and needs for further professional development.

Uses knowledge of scientific research ethics. Appreciates and respects the opinion of colleagues. Can assess own and others' attitudes towards values and contribute to the establishment of new values.

Takes great responsibility for own professional activities. Critically, with a "cold mind" evaluates the possibilities of new medicines. While working on a master's dissertation, he/she realizes the importance of the unwritten law (academic integrity) in the scientific world, as well as the objective presentation of the negative results obtained by the research. Respects Georgia's struggle for independence, history, culture and traditions.

Methods for achieving the learning outcomes

For the purpose of achieving the program learning outcomes, on the lecture, working in a group, practical lessons, independent learning, training, scientific and industrial practice, preparation and passing of the midterm assessments and final exams, working on a research paper (conference paper, scientific paper, patent application, Master's thesis), defending an educational-scientific work and in other relevant formats, the following methods are used: Method of working on the book (making extracts / notes, making a summary on a material, composing abstracts, writing an abstract or an essay, etc.), verbal method, laboratory method (aesthetics of visually presented materials, presentation technology, demonstration of equipment usage, demonstration of video material), practical method, practical method (industrial-cognitive, pedagogical, professional, field, etc.), heuristic method, etc. Means of implementing the above methods are: discussion, debates, working in groups, problem-based and action-oriented teaching, case studies and its statistical analysis, brainstorming, discussion of modeled situations, situational games, induction, deduction, analysis, synthesis, explanation, raising a rational question, solution and method, result and argumentation; Adherence to the rules, logical reasoning, making the right conclusions, optimal answers to questions.

The teaching/learning methods used in the teaching process of the concrete learning course that is component of the program are indicated in the syllabus of each training course.

Student's Knowledge Assessment System

The aim of the evaluation of student's knowledge, achieved progress, is to qualitatively determine his/her learning outcomes with regard to educational goals and parameters.

The rules of assessing the achievement of the Master's student complies with the requirements of the relevant regulatory rules and the administrative-legal acts of Saint King Tamar University of Patriarchate of Georgia concerning the assessment of the student's achievements. The principles of transparency and fairness are envisaged. Calculation of the educational program credits and evaluation of the student's achievements are conducted in accordance with the Order N3 (issued on 05.01.2007) of the Minister of Education and Science of Georgia.

The Master's Programme includes learning as well as research components. The study component provides for the study of compulsory training courses, general or free components within the graduate program. The Master's student has the right to choose the desired disciplines from the elective part of the Master's program. The learning and research work performed by the Master's student is measured by credit.

Credit in the training component provided by the Master's Programme is obtained only after the successful completion of the required work and in case of a positive evaluation of this work. The assessment of the work carried out by the Master's student involves the following: 1. The midterm assessments of the student within 60 points, which in turn include the student's academic activity, independent work, and other components (colloquium, presentation, etc.). The components of the midterm assessments and their share in various subjects are different and correspond to the interest of efficient teaching of the subject. The evaluation parameters are varied, reflected in the syllabi (their variability is allowed). The ratio between the various components is determined by the syllabus of the particular training course.

The final exam formats are differentiated according to the training courses. The right to take a final examination is given to the Master's student, who accumulates, no less than 51 scores, taking into account the maximum scores of the midterm evaluations and the final examination. The final exam grade is positive if the Master's student receives 20 or more points (50% or more of the maximum evaluation of the exam). In the case of not appearing at the exam or getting negative assessment, despite the points accumulated in other components, the Master's student will not receive the credit.

The share of the exam in the final evaluation (sum of midterm and exam grades) does not exceed 40%.

The evaluation system includes:

a) Five types of positive evaluation:

a.a) (A) Excellent - 91-100 points of assessment; a.b) (B) Very good - 81-90 points of assessment; a.c) (C) Good - 71-80 points of evaluation; a.d) (D) Satisfactory - 61-70 points; a.e) (E) Sufficient - 51-60 points. b)

Two types of negative evaluation:

b.a) (FX) Did not pass – 41-50 points of maximum evaluation, meaning that a student requires more work to pass and is given one chance to sit an additional examination after independent work;

b.b) (F) Failed - 40 points of maximum evaluation or less, that means that the work performed by a student is not sufficient and he/she has to retake the subject.

The research component of the Master's Program includes: Performing a Master's thesis, which should reflect the substantiated results of theoretical and/or empirical research; and the defense of a Master's thesis, i.e., a public presentation of the thesis.

The Master's Program is considered to be completed by the student if he/she has accumulated credits provided by the educational program and successfully defended the Master's Thesis in accordance of the rule established within the University.

The Master's thesis is a kind of summary work, by which the student's reasoning, analysis and synthesis skills in the specialty are checked, as well as the ability to see and evaluate problems. It reveals the compliance of the student's level of knowledge and the level of creative, research skills with the requirements determined by the Master's Program.

Master's thesis should meet the requirements listed below (see **Order №061/01 of the Rector of Saint King Tamar University of Patriarchate of Georgia on "Approving the rules for planning, implementation and evaluation of the scientific research component of the educational programs of Saint King Tamar University of Patriarchate of Georgia)** was issued on December 5, 2018.

The student has a supervisor while working on the Master's thesis. The supervisor of the Master's thesis is selected by the student from the academic staff of the University. The Master's student is able to choose the topic and supervisor of the Master's thesis at the beginning of the 3rd academic semester, not later than one month after the beginning of the academic semester. The topic of the Master's thesis can be changed only once, not more than two months before the end of the submission period, in agreement with the supervisor and by submitting a written application to the Dean of the main educational structural unit (faculties) of the University.

Master's thesis supervisor: In order to guide the student in the right direction of the Master's thesis, helps him/her to select a topic, compile a work plan and develop a bibliography; checks the progress of the student's work on the topic, expresses remarks and recommendations; in case of directing the research in the wrong direction, helps the student in its correction.

The supervisor of the Master's thesis has the right to make a reasoned refuse (in writing) to supervise the Master's thesis of the student, both before the start of the work and during the work on the topic, not later than one month after the beginning of the work.

Assessment of a Master's thesis

The evaluation of the draft Master's thesis/Master's thesis is carried out by the University Faculty Council. Master's project/Master's thesis shall be defended within the semester when the student finishes working on it or in the following semester. Master's project/Master's thesis shall be assessed once (by a final assessment). During the evaluation, relevant method/methods and criteria shall be used to evaluate the outcome.

Criteria and grades for MA thesis assessment:

№	Criterion	Point	Assessment of the Member of the Commission (in points)
1	The degree of argumentation of the scientific and/or methodological value of the research	0-15	

2	Correlation between the research goal, objectives and research methodology	0-15	
3	Reliability and persuasiveness of the results	0-15	
4	Compliance of the research results with the set goal and objectives	0-15	
5	Degree in mastering field/thematic academic terminology by the Master's student	0- 10	
6	Visual component of the presentation (Adequacy and sufficiency of visuals)	0-10	
7	The degree of argumentation of own position by the Master's student in the discussion	0-20	
	In total	100	

Information on the human resources necessary for the implementation of the educational program

3The human resources required for the implementation of the program are defined by the academic staff of two university Professors, and one Associate Professor, as well as 6 invited specialists (teachers), who have the necessary knowledge/skills to produce the learning outcomes of the program, holding the academic degree of Doctor or equivalent, professional experience, special training and other competencies according to the requirements of the legislation. The employment agreements concluded with academic staff and invited specialists (teachers) according to the rules established by the legislation of Georgia.

Information about material resources, needed for the program implementation;

The program is implemented on the base of Saint King Tamar University of Patriarchate of Georgia, which has modern material and technical resources and is ensured with other necessary resources: classrooms equipped with modern equipment and inventory, the library (book fund and scientific electronic databases), resources of the Center for Research, Development and Innovation, etc. Memoranda on cooperation have been signed with various structures and successful organizations and program components will be implemented using all resources available to the University.

Academic Course	Code	ECTS	Volume of study activities in astronomical hours		Distribution of credits by semesters				The lecturer	Prerequisite
			Cont act	Indepen dent	1	2	3	4		
		54								
1	2	3	4	5	6	7	8	9	10	
Biopharmaceutics	M0916.2.4.01	6	45	105	6				Invited teacher Nana Kavtaradze	No prerequisite
Drug metabolism and pharmacokinetics	M0916.2.4.02	6	45	105		6			Invited teacher Nana Kavtaradze	No prerequisite
Pharmaceutical analysis	M0916.2.4.03	6	45	105	6				Invited teacher Lela Amiranashvili	No prerequisite
Principles of biomolecular analysis	M0916.2.4.04	6	45	105		6			Invited teacher Lela Amiranashvili	No prerequisite
Molecular Pharmacology and Fundamentals	M0916.2.4.05	6	45	105	6				Invited teacher Nadezda Mushkiashvili	No prerequisite

of Molecular Biology Research 1										
Molecular Pharmacology and Fundamentals of Molecular Biology Research 2	M0916.2.4.06	6	45	105		6			Invited teacher Nadezda Mushkiashvili	M0916.2.4.05
Targeted drug delivery1	M0916.2.4.07	6	45	105		6			Associate Professor Lia Tsiklauri	No prerequisite
Targeted drug delivery 2	M0916.2.4.08	6	45	105			6		Associate Professor Lia Tsiklauri	M0916.2.4.07
Professional practice	M0916.2.4.09	6	60	90			6		Invited teacher Razhden Gelbakhiani	No prerequisite
Elective Courses		18								
Cell Biology and Biological Systems	M0916.2.4.10	6	45	105	6				Invited teacher Nadezda Mushkiashvili	No prerequisite
Fundamentals of Pharmaceutical	M0916.2.4.11	6	45	105		6			Associate Professor Lia Tsiklauri	No

Nanotechnologies										prerequisite
Fundamentals of Nanobiotechnology	M0916.2.4.12	6	45	105			6		Associate Professor Lia Tsiklauri	No prerequisite
Drug design	M0916.2.4.13	6	45	105	6				Associate Professor Lia Tsiklauri	No prerequisite
Examination and analysis of pharmaceutical products	M0916.2.4.14	6	45	105			6		Invited teacher Lela Amiranashvili	No prerequisite
Drug resistance	M0916.2.4.15	6	45	105			6		Associate Professor Lia Tsiklauri	No prerequisite
General or free components, research		50								
Academic Writing and Research Design	M01	5	45	80			5		Professor Inga Ghutidze	No prerequisite
Anthropology	M02	5	45	80			5		Professor Archimandrite Adam	No prerequisite
Foreign language (English)	M03	5	45	80	5				Professor Inga Ghutidze	No prerequisite
Statistics	M04	5	45	80			5		Invited teacher Gocha Vardosanidze	No prerequisite
Master's Thesis		30						30		

In total		122			29	35	28	30		
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Map of the goals and learning outcomes of the graduate program "Bio-pharmacy"

Program Goals	Program learning	Program learning	Program learning	Program learning
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	outcome 1	outcome 2	outcome 3	outcome 4
To prepare researchers in the field of bio-pharmacy, under the requirements of current international standards, who will be able to conduct scientific research.	\		\	
To prepare a Master of Science in Bio-pharmacy with research skills to work on the main tasks of bio-pharmacy - to maximize the therapeutic efficiency of medicinal substances and minimize their side effects.		\		
To prepare a bio-pharmacy specialist who is thoroughly versed in the fundamental principles of current				

<p>cellular and molecular pharmacology, in the basics of multiple drug resistance, selective action, and bio-penetration of drugs, target structures, and adaptive response to drug addiction; Which will have the ability to understand, critically approach existing materials, analyze new materials, draw logical, reasoned conclusions in the field of biopharmaceutical research.</p>		\		\
<p>Objective assessment of own and colleagues' attitudes towards professional, scientific</p>		\	\	

values. Make a significant contribution to the establishment of knowledge about biopharmaceutical research as a value in society.				
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Map of learning outcomes of the curriculum

Notes: 2 - enhancing of knowledge and skills, 3 - strengthening knowledge and skills

Academic Course	Program learning outcome 1	Program learning outcome 2	Program learning outcome 3	Program learning outcome 4
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Biopharmaceutics	2			2
Drug metabolism and pharmacokinetics	2		2	
Pharmaceutical analysis	2		2	2
Principles of biomolecular analysis	2	2		2
Pharmacology and Fundamentals of Molecular Biology Research 1	2	2		
Fundamentals of Molecular Biology Research 2	2	2		2
Targeted Drug Delivery 1		2	2	2
Targeted Drug Delivery 2		2	2	2
Professional practice	3	3	3	
Elective courses				
Cell Biology and Biological Systems	2		2	
Fundamentals of Pharmaceutical Nanotechnologies	2			2
Fundamentals of Nanobiotechnology	2		2	

Drug design	2		2	2
Examination and analysis of pharmaceutical products	2		2	
Drug Resistance	2		2	
General or free components, research				
Academic Writing and Research Design	2	2		
Anthropology	2	2		
Foreign language (English)	2			2
Statistics	2	2		
Scientific-research Component, Among them Preparation and defense of a Master's thesis	3	3	3	3
	Characteristics of learning outcomes			
				Note
Program learning outcome 1	1. Thorough, in-depth, and systematic knowledge in the field of bio-pharmacy research based on the latest achievements, the vision of future research problems; Also, the ability to determine and analyze the action of drugs,			

	<p>the mechanism of drug resistance, the selection of a research question, the formation of a hypothesis. The ability to manage time and resources efficiently; as a result, he/she will realize the essence, importance of bio-pharmacy research and the possibilities of its application in practical activities in both the public and private sectors.</p>	
<p>Program learning outcome 2</p>	<p>Receiving, processing competently and completely academic and practical information in native and English languages and delivering it to colleagues working with the problem and the interested public; Receive comments, remarks, and advice, express position on the key issues, defend and actively participate in the discussion.</p>	
<p>Program learning outcome 3</p>	<p>2. Based on the acquired knowledge provided by the graduate program, opportunities to apply new ideas, scientific achievements in the teaching-research process.</p>	
<p>Program learning outcome 4</p>	<p>3. Sufficient qualification to continue scientific research activities in the bio-pharmacy in doctoral studies, both in Georgia and in higher education institutions of other countries.</p>	

Academic courses syllabi

Course syllabi

are included (see attached CD-R)