



MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION
Federal state autonomous educational institution
of higher education
«Far Eastern Federal University»
(FEFU)

INSTITUTE OF LIFE SCIENCES AND BIOMEDICINE (SCHOOL)

AGREED

Head of OP

APPROVE

Head of VSP

Kalenik T.K.
(signature) (full name)
«28» September 2021 г.

Kalenik T.K.
(signature) (full name)
«28» September 2021 г.

WORKING PROGRAM OF THE DISCIPLINE
«The effectiveness of biotechnological industries»

Direction of training 19.04.01 «Biotechnology»
(«Agri-Food Biotechnology»)
Form of training full-time

course 1 semester 2
lectures 18 hours.
practical classes 18 h.
laboratory work 00 hours.
including using
total classroom hours 36 hours.
independent work 36 h.
including preparation for the exam 00 hours (if the exam is provided).
control works (quantity) are not provided
term paper / term project are not provided
credit 2 semester
exam not included

The program of the state final certification was compiled in accordance with the requirements of the Federal State Educational Standard in the field of study 19.04.01 Biotechnology, approved by order of the Ministry of Science and Higher Education of the Russian Federation dated August 10, 2021 No. 737.

The program at the meeting of the Academic Council of the Institute of Life Sciences and Biomedicine (School) December 21, 2021
Director of the Department of Food Science and Technology Kalenik T.K.
Compiled by: T.K. Kalenik, Motkina E. V.

Reverse side of the title page of the RPMU

I. The work program was revised at the meeting of the department:

Protocol dated « _____ » _____ 20__ № _____

Director _____
(signature) (full name)

II. The work program was revised at the meeting of the department:

Protocol dated « _____ » _____ 20__ № _____

Director _____
(signature) (full name)

III. The work program was revised at the meeting of the department:

Protocol dated « _____ » _____ 20__ № _____

Director _____
(signature) (full name)

IV. The work program was revised at the meeting of the department:

Protocol dated « _____ » _____ 20__ № _____

Director _____
(signature) (full name)

ANNOTATION
of the educational complex of discipline
"The effectiveness of biotechnological industries"
Direction of preparation: 19.04.01 Biotechnology
Educational program: "Agri-Food Biotechnology"

The educational-methodical complex of the discipline "The effectiveness of biotechnological industries" was developed for students of the _1_ course in the direction 19.04.01 "Biotechnology" master's program "Agri-Food Biotechnology" in accordance with the requirements of OS HE in this area and the regulation on educational-methodical complexes of disciplines of educational programs of higher professional education (approved by order of the acting rector of the FEFU dated 04/17/2012 No. 12-13-87).

The discipline "The effectiveness of biotechnological industries" is included in the variable part of the curriculum electives.

The total complexity of mastering the discipline is __72__ hours. The curriculum includes lecture classes (__18__ hours), laboratory classes (__0__ hours), practical classes (__18__ hours), independent work of the student (__36__ hours). The discipline is implemented on the _1_ course in the __2__ semester.

The content of the discipline covers a range of issues related to general issues and theoretical foundations of biotechnological processes of agri-food production, based on the application of modern achievements of science and technology; The development trends of the industry and their technological design, the scientific foundations of agri-food biotechnological processes at enterprises, intensive and resource-saving technologies of innovative products, the state of food production from raw materials of plant and animal origin are considered.

The discipline "The effectiveness of biotechnological industries" is logically and meaningfully connected with such courses as "Hardware and software of biotechnological production", "Biotechnological features of the production of plant products", "Biotechnological features of production animal products ", "Biotechnological Process Control Systems ". The development of the discipline is

closely connected with the study of the disciplines: "Modern trends in the development of biotechnology", "Safety and biosafety of agricultural raw materials and food products."

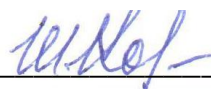
The discipline is aimed at the formation of professional competencies.

Educational complex includes:

- the work program of the discipline;
- educational and methodological support of students' independent work (Appendix 1);
- appraisal fund (appendix 2)

Директор Департамента

пищевых наук и технологий



_____ Каленик Т.К.

ABSTRACT

Bachelor's/Specialist's/Master's degree in 19.04.01 Biotechnology
Study profile/ Specialization/ Master's Program "Title" «Agri-Food Biotechnology»

Course title: The effectiveness of biotechnological industries

Variable part of Block, _2_credits

At the beginning of the course a student should be able to:

- the ability to quickly master new subject areas, identify inconsistencies, problems and develop alternative solutions to them;
- the ability to lead a scientific discussion.

Course description: Scientific and technological bases of designing foods with desired properties for various purposes is intended to guide the preparation of 19.04.01 Biotechnology functionality «Agri-Food Biotechnology».

The total complexity of the development of the discipline is 2 credits. The curriculum provides students' independent work (36). Discipline is implemented on 1 course 1 semester.

Learning outcomes:

SPC-8 ability to conduct a feasibility study of production and the preparation of technical and economic documentation;

SPC-13 readiness for organization, planning and management of existing biotechnological processes and production.

Main course literature: 1. Pishchevaya biotekhnologiya produktov iz syria rastitelnogo proiskhozhdeniya: Ucheb. / O.A. Neverova. A.Yu. Prosekov i dr. - M.: NITs INFRA-M. 2014. - 318 s.: 60x90 1/16 ISBN 978-5-16-005309-7. (500 ekz). <http://znanium.com/go.php?id=363762>

2. Biotekhnologiya kombinirovannykh pishchevykh produktov na osnove molochnogo i mikrobiologicheskogo syria : metod. ukazaniya k labor. rabotam dlya studentov spets. 240902 "Pishchevaya biotekhnologiya" vsekh form obucheniya / sost. N.V. Situn. E.S. Fishchenko . Biotekhnologiya molochnogo proizvodstva. Vladivostok : Izd-vo Tikhookeanskogo ekonomicheskogo

universiteta . 2009. – 96 c.. (8 ekz.).

<http://lib.dvfu.ru:8080/lib/item?id=chamo:357087&theme=FEFU>

3. Biotekhnologiya kombinirovannykh pishchevykh produktov i ikh analogov na osnove syria zhivotnogo proiskhozhdeniya : metod. ukazaniya k vypolneniyu laboratornykh rabot dlya studentov spets. 240902 "Pishchevaya biotekhnologiya" / sost. L.M. Povoyko. L.A. Tekutyeva. T.A. Shepel. Vladivostok : Izd-vo Tikhookeanskogo ekonomicheskogo universiteta . 2008. – 40 c.. (8 ekz.).

<http://lib.dvfu.ru:8080/lib/item?id=chamo:352729&theme=FEFU>

4. Biotekhnologiya : uchebnoye posobiye / Yu. O. Sazykin. S. N. Orekhov. I. I. Chakaleva ; pod red. A. V. Katlinskogo. Moskva : Akademiya . 2006. – 255 s. <http://lib.dvfu.ru:8080/lib/item?id=chamo:257572&theme=FEFU>

5. Biotekhnologiya : uchebnyk dlya vuzov / S. M. Klunova. T. A. Egorova. E. A. Zhivukhina. Moskva : Akademiya . 2010. – 256 s. (5 ekz.)

<http://lib.dvfu.ru:8080/lib/item?id=chamo:416005&theme=FEFU>

Form of final knowledge control: credit

1. Purpose and objectives of mastering the discipline:

The purpose of the study of the discipline is to familiarize undergraduates with general questions and theoretical basic biotechnological processes of agri-food production, based on the application of modern achievements of science and technology.

Objectives of the discipline:

- 1. study of industry development trends and their technological design;
- the study of the scientific foundations of agri-food biotechnological processes in enterprises;
- the study of intensive and resource-saving technologies for the production of innovative products;
- study of the state of food production from raw materials of plant and animal origin.

As a result of studying this discipline, the following professional competencies (elements of competencies) are formed in students.

Code and wording of competency	Competency Stages	
SPC-8 ability to conduct a feasibility study of production and the preparation of technical and economic documentation	Knows	knows the methods of technical and economic analysis of production and the preparation of technical and economic documentation
	Is able	To apply methods of feasibility analysis of production and preparation of feasibility documentation
	Owens	The skills of using the methods of the feasibility study of production and the preparation of technical and economic documentation
SPC-13 readiness for organization, planning and management of existing biotechnological processes and production	Knows	Methods of organization, planning and management of existing biotechnological processes and production
	Is able	To apply the methods of organization, planning and management of existing biotechnological processes and production
	Owens	Skills of organization, planning and management of existing biotechnological processes and production

2. The complexity of the discipline and types of training sessions in the discipline

The total labor intensity of the discipline is 3 credit units (108 academic hours).

The types of training sessions and work of the student in the discipline can be:

Designation	Types of training sessions and work of the student
Lec	Lectures
Lab	Labs
Pe	Practical exercises
Oc	Online course
SR	Independent work of the student during the period of theoretical training
Control	Independent work of the student and contact work of the student with the teacher during the period of intermediate certification

Discipline structure:

The form of education is full-time.

I. STRUCTURE AND CONTENT OF THE THEORETICAL PART OF THE COURSE

Section I. The effectiveness of biotechnological industries / Methods for assessing and managing food biotechnological industries (12 hours)

Topic 1 The basic principles of the organization of biotechnological production (6 hours.)

Basic concepts and definitions. The principles of organization of biotechnological production.

Topic 2. Methods of managing biotechnological production (6 hours.)

The hierarchical structure of the enterprise. The main methods and features of biotechnological production management.

Section II. Methods for assessing production efficiency (6 hours)

Topic 1. Criteria for assessing the effectiveness of biotechnological production (4 hours.)

Efficiency and competitiveness indicators. The main ways to determine the cost of production. Features of biotechnological industries in the assessment of cost.

Topic 2. Features of the calculations of comparative efficiency (2 hours.)

Basic concepts. Examples of the feasibility study of investments by the method of comparative efficiency by type of professional activity.

II. STRUCTURE AND CONTENT OF THE PRACTICAL PART OF THE COURSE

Practical classes (18 hours)

Practical lesson №1 Theoretical foundations of economic assessment (6 hours).

1. **Purpose of work:** to study the theoretical foundations of economic evaluation.

2. **Tasks:**

2.1. Learn the basics of economic valuation of the enterprise.

2.2. Carry out an economic assessment of the enterprise using an example.

2.3 Make a conclusion on the work done.

Practical lesson № 2. Methods for assessing economic

Efficiency: general characteristic (4 hours).

1. **Purpose of work:** to introduce students to methods of evaluating economic efficiency.

2. **Tasks:**

- 2.1 To study the methods of evaluating economic efficiency.
- 2.2 to Assess the economic efficiency of the enterprise on the example.
- 2.3 Make a conclusion on the work done.

Practical lesson number 3. The method of comparative economic efficiency of technical solutions (6 hours).

1. Purpose of work: to get acquainted with the methods of comparative economic efficiency of technical solutions.

2. Tasks:

- 2.1 To study the methods of comparative economic efficiency of technical solutions.
- 2.2. Carry out a comparative assessment of the economic efficiency of technical solutions using an example.
- 2.3 Make a conclusion on the work done.

Practical lesson number 4. Features of the calculations of comparative efficiency in various situations (2 hours).

1. Purpose of work: to introduce students to the calculations of comparative effectiveness in various situations.

2. Assignment:

- 2.1. To study the features of the calculations of comparative effectiveness in various situations.
- 2.2. Carry out the calculation of comparative effectiveness in various situations. According to the assignment.
- 2.3 Make a conclusion on the work done.

III. TRAINING AND METHODOLOGICAL SUPPORT OF STUDENTS'S INDEPENDENT WORK

Educational and methodological support for students' independent work in the discipline "The effectiveness of biotechnological industries" is presented in Appendix 1 and includes:

- a schedule of independent work on the discipline, including approximate norms of time to complete each task;
- characteristics of tasks for independent work of students and guidelines for their implementation;
- requirements for the presentation and presentation of the results of independent work;
- criteria for evaluating the performance of independent work.

IV. CONTROL OF ACHIEVING COURSE OBJECTIVES

№	Supervised sections / topics of discipline	Codes and stages of formation of competencies		Evaluation Tools	
				current control	intermediate certification
1	Section I. The effectiveness of biotechnological industries	SPC-8, SPC-13	Knows	Interview	Credit Questions 1-5
			Is able	interview	Credit Questions 6-16
			Owens	Practical work 1.2	Credit Questions 6-16
2	Section II. Production Evaluation Methods	SPC-8, SPC-13	Knows	interview	Credit Questions 6-16
			Is able	interview	Credit Questions 6-16
			Owens	Practical work 3-4	Credit Questions 6-16

Typical control tasks, methodological materials that determine the procedures for assessing knowledge, skills and experience, as well as criteria and indicators

necessary for assessing knowledge, skills, and characterizing the stages of formation of competencies in the process of mastering an educational program are presented in Appendix 2.

V. LIST OF TRAINING LITERATURE AND INFORMATION AND METHODOLOGICAL SUPPORT OF DISCIPLINE

Main literature

(electronic and print editions)

1. Food biotechnology products from raw materials of plant origin: Textbook. / O.A. Neverova, A.Yu. Prosekov et al. - M.: SIC INFRA-M, 2014. -- 318 p.: 60x90 1/16 ISBN 978-5-16-005309-7, (500 copies).

<http://www.iprbookshop.ru/4160.html>

2. Biotechnology of combined foods based on dairy and microbiological raw materials: method. directions to the lab. works for students special. 240902 "Food biotechnology" of all forms of education / comp. N.V. Xitun, E.S. Fishchenko. Biotechnology of dairy production, Vladivostok: Publishing House of the Pacific Economic University, 2009. - 96 p., (8 copies).

<http://lib.dvfu.ru:8080/lib/item?id=chamo:357087&theme=FEFU>

3. Biotechnology of combined food products and their analogues based on raw materials of animal origin: method. instructions for laboratory work for special students. 240902 "Food biotechnology" / comp. L.M. Povoiko, L.A. Tekutieva, T.A. Shepel, Vladivostok: Publishing House of the Pacific Economic University, 2008. - 40 p., (8 copies).

<http://lib.dvfu.ru:8080/lib/item?id=chamo:352729&theme=FEFU>

4. Biotechnology: a textbook for agricultural universities / V. A. Chkhenkeli. - St. Petersburg: Prospect of Science, 2014. -- 335 p.

<http://lib.dvfu.ru:8080/lib/item?id=chamo:785504&theme=FEFU>

5. Biotechnology: a textbook for high schools / S. M. Klunova, T. A. Egorova, E. A. Zhivukhina, Moscow: Academy, 2010. - 256 p. (5 copies)
<http://lib.dvfu.ru:8080/lib/item?id=chamo:416005&theme=FEFU>

Additional literature

(electronic and print editions)

1. Maksimova, Yu. G. Microbial biofilms in biotechnological processes / (VRT) 000252550 Biotechnology: theoretical and scientific-practical journal. - 2012. - No. 4. P. 9-24.
<http://lib.dvfu.ru:8080/lib/item?id=chamo:702323&theme=FEFU>

2. Food biotechnology / L.A. Ivanova, L.I. War, I.S. Ivanova. Processing of plant materials / M.: KolosS, 2008. - 472 c., (5 copies.)
<Http://lib.dvfu.ru:8080/lib/item?id=chamo:352320&theme=FEFU>

3. The basic principles of processing raw materials of plant, animal, microbiological origin and fish: method. directions for students special. 240902 "Food biotechnology" of all forms of education / comp. E.V. Makarova, Vladivostok: Publishing House of the Pacific Economic University, 2009. - 80 p. (10 copies) <http://lib.dvfu.ru:8080/lib/item?id=chamo:356130&theme=FEFU>

4. Biotechnology of seafood: a textbook for universities and colleges / ed. O.Ya. Mezenova, M.: Mir, 2006. - 560 p.
<http://lib.dvfu.ru:8080/lib/item?id=chamo:358859&theme=FEFU>

5. Biotechnology of meat and meat products: lecture course: a textbook for universities / I. A. Rogov, A. I. Zharinov, L. A. Tekutieva et al. Moscow: DeLi Print, 2009. - 294 p., 5 L. silt.
<http://lib.dvfu.ru:8080/lib/item?id=chamo:664778&theme=FEFU>

6. Popova, N.N. Food and biologically active additives [Electronic resource]: study guide / N.N. Popova, E.S. Popov, I.P. Shchetilina. - The electron. Dan. - Voronezh: VGUIT, 2016. - 67 p. - Access mode:
<https://e.lanbook.com/book/92220>

The list of resources of the information and telecommunication network

«Internet»

1. <http://elibrary.ru> Scientific Electronic Library eLIBRARY.RU
2. The electronic library system "Doe" <http://e.lanbook.com/>
3. The electronic library system "IPRBOOK" <http://www.iprbookshop.ru>
4. Scopus database: <http://www.scopus.com/home.url>
5. Web of Science Database <http://apps.webofknowledge.com/>
6. Database of full-texting academic journals in China <http://oversea.cnki.net/>
7. The electronic library of dissertations of the Russian State Library <http://diss.rsl.ru/>
8. EBSCO Electronic Databases <http://search.ebscohost.com/>

VI. METHODOLOGICAL INSTRUCTIONS FOR THE DEVELOPMENT OF THE DISCIPLINE

Guidelines for organizing an independent study of the discipline.

To study the discipline, it is necessary to recall and systematize the knowledge obtained earlier in this branch of scientific knowledge. When studying material on a textbook, it is necessary, first of all, to clarify the essence of each question posed there. The main thing is to understand what is stated in the textbook, and not to "memorize". First you should read all the material of the topic (paragraph), especially not lingering on what seemed not quite clear: often this becomes clear from the following. Then you need to return to the places that caused difficulties and carefully understand what was unclear. When re-reading, special attention should be paid to the wording of the corresponding definitions, formulas, etc .; in exact formulations, as a rule, every word is essential and it is very useful to understand why this provision is formulated in this way. However, one should not try to memorize the wording; It is important to understand their meaning and be able to present the result in your own words. Having completed the study of the section, it is useful to draw up a short summary, if possible,

without looking at the textbook (study guide). When studying a discipline, special attention should be paid to the acquisition of skills for solving professionally oriented tasks. To do this, having studied the material of this topic, you must first understand the solutions to the corresponding problems that were discussed in practical classes, are given in educational materials, manuals, textbooks, Internet resources, paying particular attention to the guidelines for their solution. Then you need to independently solve several similar problems from the collections of tasks, and then solve the corresponding problems from the collections of test tasks and tests. After completing the study of the section, you need to check the ability to answer all questions of the program of the course on this topic (to carry out self-testing). All issues that need to be studied and learned are listed in sufficient detail in the program. However, it is very useful to compile a list of such questions on your own (in a separate notebook) as follows: - having begun studying the next topic of the program, first write down in a notebook all the questions listed in the program for this topic, leaving a wide column on the right; - as you study the material of the section (reading a textbook, teaching aids, lecture notes), you should indicate in the right column the page of the educational publication (lecture notes) on which the corresponding question is stated, as well as the number of the formula that express the answer to this question. As a result, this notebook will contain a complete list of questions for self-testing, which can also be used in preparing for the test. In addition, by answering a question or by writing the appropriate formula (equation), you can quickly check whether it is done correctly if you doubt the correctness of your answer using a textbook (lecture notes). Finally, on a notebook with such questions, you can determine whether you have studied all the material provided for in the program. It should be borne in mind that in various educational publications material can be presented in different sequences. Therefore, the answer to some question of the program may appear in another chapter, but of course this will not affect the study of the course as a whole. Instructions for the implementation of test tasks and tests are given in the

educational literature, in which each task is given specific guidelines for its solution and provides an example of a solution.

VII. MATERIAL AND TECHNICAL SUPPORT OF DISCIPLINE

Name of equipped premises and premises for independent work	List of main equipment
<p>The classroom for lectures, practical classes, group and individual consultations, ongoing monitoring and interim certification.</p> <p>Vladivostok, Russian Island, Ajax d.10, Building 25.1, aud. M329.</p>	<p>Training furniture for 25 workplaces, teacher's place (table, chair),</p> <p>Multimedia equipment: Monoblock Lenovo C360G-i34164G500UDK; Screen with electric 236 * 147 cm Trim Screen Line; DLP projector, 3000 ANSI Lm, WXGA 1280x800, 2000: 1 EW330U Mitsubishi; Subsystem of specialized hardware mounts CORSA-2007 Tuarex; Video Switching Subsystem: DVI DXP 44 DVI Pro Extron matrix switcher; Extender DVI over twisted pair DVI 201 Tx / Rx; Subsystem of audio switching and sound reinforcement; ceiling mount speaker SI 3CT LP Extron; Sennheiser EW 122 G3 UHF Microphone Lavalier Radio System with a wireless microphone and receiver; DMP 44 LC Extron digital audio processor; Extron IPL T S4 Network Management Controller; Wireless LANs for students are provided with a system based on 802.11a / b / g / n 2x2 MIMO (2SS) access points.</p>
<p>Reading rooms of the FEFU Scientific Library with open access to the fund (building A - level 10)</p>	<p>All-in-One HP All-in-One 400 All-in-One Monoblock 19.5 (1600x900), Core i3-4150T, 4GB DDR3-1600 (1x4GB), 1TB HDD 7200 SATA, DVD +/- RW, GigEth, Wi-Fi, BT, usb kbd / mse, Win7Pro (64-bit) + Win8.1Pro (64-bit), 1-1-1 Wty Internet access speed of 500 Mbps.</p> <p>Workplaces for people with disabilities are equipped with braille displays and printers; equipped with: portable devices for reading flat-printed texts, scanning and reading machines with a video enlarger with the ability to control color spectra; magnifying electronic magnifiers and ultrasonic markers</p>
<p>Audience for independent work of students</p> <p>Vladivostok, Russian island, item Ajax 10, Building 25.1, aud. M621</p> <p>Area 44.5 m2</p>	<p>Monoblock Lenovo C360G-i34164G500UDK 19.5 "Intel Core i3-4160T 4GB DDR3-1600 SODIMM (1x4GB) 500GB Windows Seven Enterprise - 17 pcs; Wired LAN - Cisco 800 series; Wireless LAN for students with a system based on 802.11a / b access points / g / n 2x2 MIMO (2SS).</p>



МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ
Федеральное государственное автономное образовательное учреждение
высшего образования
«Дальневосточный федеральный университет»
(ДФУ)

ИНСТИТУТ НАУК О ЖИЗНИ И БИОМЕДИЦИНЫ (ШКОЛА)

**УЧЕБНО-МЕТОДИЧЕСКОЕ ОБЕСПЕЧЕНИЕ САМОСТОЯТЕЛЬНОЙ
РАБОТЫ ОБУЧАЮЩИХСЯ**

по дисциплине «The effectiveness of biotechnological industries»

Направление подготовки 19.04.01 Биотехнология

Магистерская программа «Agri-Food Biotechnology»

Форма подготовки очная

**Владивосток
2021**

Schedule of independent work on the discipline

№	Deadlines	Type of independent work	Estimated time to complete	Form of control
1	1-3 week	Study of lecture material on abstracts and educational literature	18	Interview
2	2-4 week	Study of lecture material on abstracts and educational literature	12	Interview
3	5-9 week	Practical training	6	Interview

Questions for an interview

1 Basic principles of the organization of biotechnological production. Basic concepts and definitions.

2 Principles of organization of biotechnological production.

3 Ways to manage biotechnological production.

4 The hierarchical structure of the enterprise.

5 The main methods and features of biotechnological production management.

6 Methods for assessing production efficiency.

7 Criteria for assessing the effectiveness of biotechnological production.

8 Performance and competitiveness indicators.

9 The main methods of determining the cost of production.

10 Features of biotechnological industries in the evaluation of cost.

11 Features of the calculations of comparative efficiency. Basic concepts.

12 Examples of the feasibility study of investments by the method of comparative effectiveness by type of professional activity.

13 Theoretical foundations of economic assessment

14 Methods for assessing economic efficiency: a general description.

15 Method of comparative economic efficiency of technical solutions.

16 Features of the calculations of comparative efficiency in various situations.

The purpose of the student's independent work is to meaningfully and independently work first with educational material, then with scientific information, lay the foundations of self-organization and self-education in order to instill the ability to further continuously improve their professional qualifications.

The process of organizing independent work of students includes the following steps:

- preparatory (setting goals, drawing up a program, preparing methodological support, preparing equipment);
- main (implementation of the program, the use of information retrieval, assimilation, processing, application, transfer of knowledge, fixing results, self-organization of the work process);
- final (assessment of the significance and analysis of the results, their systematization, evaluation of the effectiveness of the program and methods of work, conclusions about the directions of labor optimization).

In the process of independent work, the student acquires the skills of self-organization, self-control, self-management, self-reflection and becomes an active independent subject of educational activity. The independent work of students should have an important influence on the formation of the personality of a future specialist; it is planned by the student independently. Each student independently determines the mode of his work and the measure of labor spent on mastering the educational content in each discipline. He performs extracurricular work on a personal individual plan, depending on his training, time and other conditions.

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Requirements for the presentation and presentation of the results of independent work

There are no special requirements for the provision and presentation of the results of this independent work.



МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ
Федеральное государственное автономное образовательное учреждение
высшего образования
«Дальневосточный федеральный университет»
(ДФУ)

ИНСТИТУТ НАУК О ЖИЗНИ И БИОМЕДИЦИНЫ (ШКОЛА)

ФОНД ОЦЕНОЧНЫХ СРЕДСТВ
по дисциплине «The effectiveness of biotechnological industries»
Направление подготовки 19.04.01 Биотехнология
Магистерская программа «Agri-Food Biotechnology»
Форма подготовки очная

Владивосток
2021

FOS PASSPORT

Code and wording of competency	Competency Stages	
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	Is able	To apply methods of feasibility analysis of production and preparation of feasibility documentation
	Owens	The skills of using the methods of the feasibility study of production and the preparation of technical and economic documentation
SPC-13 readiness for organization, planning and management of existing biotechnological processes and production	Knows	Methods of organization, planning and management of existing biotechnological processes and production
	Is able	To apply the methods of organization, planning and management of existing biotechnological processes and production
	Owens	Skills of organization, planning and management of existing biotechnological processes and production

№	Supervised sections / topics of discipline	Codes and stages of formation of competencies		Evaluation Tools	
				current control	intermediate certification
1	Section I. The effectiveness of biotechnological industries	SPC-8, SPC-13	Knows	Interview	Credit Questions 1-5
			Is able	interview	Credit Questions 6-16
			Owens	Practical work 1.2	Credit Questions 6-16
2	Section II. Production Evaluation Methods	SPC-8, SPC-13	Knows	interview	Credit Questions 6-16
			Is able	interview	Credit Questions 6-16
			Owens	Practical work 3-4	Credit Questions 6-16

Шкала оценивания уровня сформированности компетенций

Code and wording of competency	Competency Stages		Criteria	Indicators	Points
SPC-8 ability to conduct a feasibility study of production and the preparation of technical and economic documentation	knows (threshold level)	Fragmented ideas about the methods of technical and economic analysis of production and the preparation of technical and economic documentation	Poll	The student conducts a fairly independent analysis of the main stages and semantic components of the problem; understands the basic foundations and theoretical justification of the chosen topic. The main sources on this topic were brought. No more than 2 errors were made in the sense or content of the problem, the design of the work.	75-61
				The work is a retransmitted or completely rewritten source text without any comments or analysis. The structure and theoretical component of the topic is not disclosed. Three or more than three errors were made in the semantic content of the	60-50

				problem being revealed and in the design of the work.	
	able (advanced)	Formed ideas about the application of methods of technical and economic analysis of production and the preparation of technical and economic documentation	Poll	The work is characterized by semantic integrity, coherence and consistency of presentation; no more than 1 mistake was made in explaining the meaning or content of the problem. For argumentation, data from domestic and foreign authors are given. Demonstrated research skills. There are no actual errors related to understanding the problem. One or two errors in the design of the work	85-76
	owns (high)	Enhanced understanding of the use of methods of feasibility analysis of production and the preparation of technical and economic documentation	Poll	The work is characterized by semantic integrity, coherence and consistency of presentation; no more than 1 mistake was made in explaining the meaning or content of the problem. For argumentation, data from domestic and foreign authors	100-86

				Three or more than three errors were made in the semantic content of the problem being revealed and in the design of the work.	
	able (advanced)	Formed knowledge on the application of methods of organization, planning and management of existing biotechnological processes and production	Poll	The work is characterized by semantic integrity, coherence and consistency of presentation; no more than 1 mistake was made in explaining the meaning or content of the problem. For argumentation, data from domestic and foreign authors are given. Demonstrated research skills. There are no actual errors related to understanding the problem. One or two errors in the design of the work	85-76
	owns (high)	Extended knowledge about the organization, planning and management of existing biotechnological processes and production	Poll	The work is characterized by semantic integrity, coherence and consistency of presentation; no more than 1 mistake was made in explaining the meaning or	100-86

				<p>content of the problem. For argumentation, data from domestic and foreign authors are given. Demonstrated research skills. There are no actual errors related to understanding the problem. One or two errors in the design of the work</p>	
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Guidelines that determine the procedures for assessing the results of mastering the discipline

Current certification of students. It is carried out in accordance with the local regulatory acts of FEFU and is mandatory. It is carried out in the form of control measures: protection of the control work, interviews to assess the actual results of student learning and is carried out by a leading teacher.

The objects of evaluation are:

- academic discipline (activity in the classroom, the timely completion of various types of tasks, attendance of all types of classes in the certified discipline);
- the degree of assimilation of theoretical and practical knowledge (survey);
- results of independent work.

Interim certification of students. It is carried out in accordance with the local regulatory acts of FEFU and is mandatory. It provides for the accounting of the results of all stages of the development of the course. Subject to the successfully passed two stages of the current certification, the student is exposed to intermediate certification (offset).

Examination materials. When assessing students' knowledge by intermediate control, the amount of knowledge, the quality of their assimilation, understanding of the logic of academic discipline, the place of each topic in the

course is taken into account. Evaluated is the ability to freely, competently, logically harmoniously present the studied, the ability to reasonably defend one's own point of view.

Criteria for grading a student in the standings in the discipline "The effectiveness of biotechnological industries":

Points	Credit Score	Requirements for formed competencies
100-85	<i>“excellent”</i>	The student is rated as “excellent” if he has deeply and firmly mastered the program material of the discipline, knows all methods of food design, methods of determining the biological and energy value of food, digestibility and digestibility of food substances, taking into account the characteristics of the human body. He owns the basic technologies for the manufacture of food products. Knows regulatory documentation.
84-75	<i>“good”</i>	A student is rated “good” if he has learned the program material of the discipline, knows the basic methods of food design, methods for determining the biological and energy value of food, digestibility and digestibility of food substances, taking into account the characteristics of the human body. He owns the basic technologies for the manufacture of food products. Knows regulatory documentation.
74-61	<i>“satisfactory”</i>	A student is rated “satisfactory” if he has knowledge of only the basic material, allows inaccuracies, and knows the basic methods for designing food products, basic methods for determining the biological and energy value of food, digestibility and digestibility of food substances, taking into account the characteristics of the human body. He owns the basic technologies for the manufacture of food products. Knows basic regulatory documentation.
60-0	<i>“unsatisfactory”</i>	The grade “unsatisfactory” is given to a student who does not know a significant part of the program material, makes significant mistakes, does not know the basic methods of food design, the basic methods for determining the biological

		and energy value of food, digestibility and digestibility of food substances, taking into account the characteristics of the human body. Does not own basic food manufacturing technologies. Does not know the basic regulatory documentation.
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Questions for credit

- 1 Basic principles of the organization of biotechnological production. Basic concepts and definitions.
- 2 Principles of organization of biotechnological production.
- 3 Ways to manage biotechnological production.
- 4 The hierarchical structure of the enterprise.
- 5 The main methods and features of biotechnological production management.
- 6 Methods for assessing production efficiency.
- 7 Criteria for assessing the effectiveness of biotechnological production.
- 8 Performance and competitiveness indicators.
- 9 The main methods of determining the cost of production.
- 10 Features of biotechnological industries in the evaluation of cost.
- 11 Features of the calculations of comparative efficiency. Basic concepts.
- 12 Examples of the feasibility study of investments by the method of comparative effectiveness by type of professional activity.
- 13 Theoretical foundations of economic assessment
- 14 Methods for assessing economic efficiency: a general description.
- 15 Method of comparative economic efficiency of technical solutions.
- 16 Features of the calculations of comparative efficiency in various situations.