Federal State Autonomous Educational Institution of Higher Education "Peoples' Friendship University of Russia"

Agrarian and technological institute

Recommended by ISSC

EDUCATIONAL AND METHODICAL COMPLEX

INNOVATION TECHNOLOGIES IN STANDARDIZATION

Recommended for specialty

27.03.01 Standardization and metrology

Focus of the program (profile) Standardization and metrology

2021

1. The aims and objectives of discipline:

The purpose of the discipline: To form a system of professional knowledge, abilities, skills in modern technologies for the production of food products in students

Discipline objectives:

- Studying the achievements of science and technology in the field of technology for the production of food products;

- Study of effective methods of using raw materials of animal and vegetable origin;

- Study of technological and work processes on technological lines for product processing.

2. Place the HEC structure discipline:

Discipline refers to a block of elective disciplines in the variable part of the curriculum.
Table 1 shows the previous and subsequent disciplines aimed at the formation of discipline competencies in accordance with the competence matrix of HEC.

Table 1

№ п/п	Шифр и наименование компетенции	Предшествующие дисциплины	Последующие дисциплины (группы дисциплин)
General professional competencies:			
1.	Able to use fundamental knowledge in the field of standardization and metrological support to improve in professional activity (GPC -3).	Methods and systems of standardization; Food product identification; Food analysis methods	Examination of regulatory documents; Jurisprudence in standardization; Accreditation systems; Certification of technological processes, production
2.	Able to use fundamental knowledge in the field of standardization and metrological support to improve in professional activity (GPC -4).	Methods and systems of standardization; Food product identification; Food analysis methods	Examination of regulatory documents; Product design fundamentals
3.	Able to solve the problems of the development of science, technology and technology in the field of standardization and metrological support, taking into account the legal regulation in the field of intellectual property (GPC -5)	Food product identification; Food analysis methods	
4.	Able to make scientifically grounded decisions in the field of standardization and metrology based on methods of system and functional analysis (GPK -6)	Food product identification; Food analysis methods	Examination of regulatory documents; Jurisprudence in standardization; Certification of technological processes,

			production
5.	Able to make scientifically grounded decisions in the field of standardization and metrology based on methods of system and functional analysis (GPC -7)	Methods and systems of standardization; Food analysis methods	
6.	Able to develop technical documentation (including in electronic form) related to professional activities, taking into account the current quality standards (GPC -8)	International resources in standardization; Fundamentals of technical regulation	Certification of technological processes, production; Examination of regulatory documents; Accreditation systems
Professional competencies:			
7.	Able to introduce new methods and means of technical control (PK -3);	Organization and technology of tests; Methods and systems of standardization	

3. Requirements to the development results of discipline:

Learning discipline aims at the formation of the following competencies:

General professional competencies:

- Able to use fundamental knowledge in the field of standardization and metrological support to improve in professional activity (GPC -3).
- Able to use fundamental knowledge in the field of standardization and metrological support to improve in professional activity (GPC -4).
- Able to solve the problems of the development of science, technology and technology in the field of standardization and metrological support, taking into account the legal regulation in the field of intellectual property (GPC -5)
- Able to make scientifically grounded decisions in the field of standardization and metrology based on methods of system and functional analysis (GPK -6)
- Able to make scientifically grounded decisions in the field of standardization and metrology based on methods of system and functional analysis (GPC -7)
- Able to develop technical documentation (including in electronic form) related to professional activities, taking into account the current quality standards (GPC -8)

Professional competencies:

- Able to introduce new methods and means of technical control (PK -3);

As a result of study of discipline a student have to:

Know the: know the Organization and technology of standardization, the procedure for development, approval. Implementation of technical regulations, standards, technical specifications and other technical documentation; requirements for building technical regulations and standard methods for forecasting and optimization, standardization and building-block approach when developing standards and normative documents.

Be able to: prepare and use technical regulations and standards to prepare draft technical regulations, standards and technical conditions, be the explanatory note thereto; determine the usefulness of the work on updating standards; develop new and revise existing standards, specifications and other documents for Standardization; comply with the requirements for building, presentation, execution of the standard apply methods of standardization in the development of standards and other normative and technical documentation.

To own : characteristics of development of technical regulations, standards and normative documentation; the rules update and lifting standards; build rules of presentation and design standards and normative documents.

4. Scope of discipline and types of educational work

Total labour input of discipline is 4 credits.

Type of training	Total hours	Semesters			
		1	2	3	4
Classroom training (total)					
Lectures	26	-	-	18	18
Practical exercises	35	-	-	27	27
Independent work (total)	83			63	17
Term project (work)		-	-		
Summary					
Other types of independent work	**144**	-			
Total	144				
Credits	4				

5. The content sections of the discipline

5.1. The contents of the sections of discipline

No. p/p	Name of the discipline section	Content section
1.	Principles of standardization	Basic principles of standardization in the Russian Federation to ensure the achievement of the goals and objectives of its development.
2.	Technology and scientific and technological progress	Innovations as an object of innovative management. The influence of technical progress on the creation of fundamentally new technologies. The main directions of the technological process in the agro-industrial complex. High-tech technologies, their role and importance in modern production. Innovative technologies in the production of food raw materials and food products. Metrological aspects of food safety. Production methods and technologies at all stages of safe food production. Metrological assurance of quality control of food products. Modern methods and means of non-destructive express control of product safety and quality. Decision making and development of safety recommendations.
3.	Technical regulation in the development of scientific and technical innovation in the agro-industrial complex.	The role of advanced technologies in the global economic system. The role of technology and technological infrastructure in the modern economy. High technology products and macro technology. Ways of integration into the world market of high technology products. Metrology, standardization and certification as activities to ensure the quality and safety of products.
4.	System analysis of the effectiveness of technological innovation	Generalization of economic, organizational, scientific and technical factors of technology options into indicators of the technical and economic level. Legislative and regulatory framework for conformity assessment. Enterprise development management trends. Classification groups of innovations: technological (product and process); degree of novelty (internationally and for the Russian Federation); significance based on scientific discoveries and inventions (new technological level).
5	Organization of the production process at the enterprise	Formation of quality in the production process. The production process as a set of labor and natural processes. Basic requirements for the organization

		of the production process. The production program and methods of its formation. Anti-crisis solutions in technologies and equipment for the food industry. Creation of high-tech processes for the production of new competitive products. Classification and principles of operation of technological equipment and rules for its safe operation.
6	Creation of a business plan for the enterprise	A production-oriented concept. A performance-oriented concept. Production plan and product sales. Industrial base. Forecast of consumption of material resources. The need for workers and management personnel. Current costs. Environmental safety of the project: measures, costs, efficiency. Optimization of the personnel structure of the enterprise personnel. Evaluation of the effectiveness of the personnel policy of the enterprise. Structural and functional model of the personnel management system.

5.2. Sections of disciplines and types of classes

№	The name of the discipline section	Lectures	Seminar	independent work	Total hours
1.	Principles of standardization	4	5	14	23
2.	Technology and scientific and technological progress	4	6	14	24
3.	Technical regulation in the development of scientific and technical innovation in the agro-industrial complex.	5	6	15	26
4.	System analysis of the effectiveness of technological innovation	5	6	14	25
5.	Organization of the production process at the enterprise	4	6	14	24
6.	Creation of a business plan for the enterprise	4	6	14	24

6. Practical exercises (seminars)

№	The name of the discipline section	The subjects of practical exercises (seminars)	Employment capacity (h)
1.	**1**	Basic principles of standardization in the Russian Federation	5
2.	**2**	Innovations as an object of innovative management.	6
3.	**3**	The role of advanced technologies in the global economic system	6
4.	**4**	Generalization of economic, organizational, scientific and technical factors of technology options into indicators of the technical and economic level.	6
5.	**4**	Creation of high-tech processes for the production of new competitive products.	6
6.	**6**	A production-oriented concept. A performance-oriented concept.	6

7. Material and technical support of the discipline:

Auditorium of the RUDN University, including classrooms equipped with projectors and computers, as well as classrooms equipped for interactive classes; electronic resources of RUDN University, including for computer testing; educational literature.

8. Information support of the discipline:

a) software: when studying the discipline, the following computer programs and tools Microsoft Office, Microsoft Word, Microsoft Excel, Microsoft Access can be used

b) databases, information and reference and search systems:

http://www.gost.ru/ ,

http://www.vniis.ru/,

http://www.rospotrebnadzor.ru/,

http://www.complexdoc.ru//,

http://www.tsouz.ru/,

http://www.ras.ru/,

http://www.vniro.ru/,

http://www.vniimp.ru/,

http://www.vniims.ru/,

http://www.rsl.ru/

9. Educational and methodological support of the discipline:

a) main literature

1) V.I. Teplov, N.M. Beletskaya, L.A. Dogaeva Functional food products: Textbook. - M: A-Prior, 2015. -- 240 p.
2) V.G. Versan Technical regulation: theory and practice -M.: JSC "Publishing house" Economics ", 2013
3) Shevchenko V.A., Karaseva A.P., Lazarev V.G., Commodity research and examination of goods M. INFRA - M. 2014
4) Okrepilov V.V. Technical regulation in Russia M.: Economy - 2015
5) Antipova L.V., Bezryadin N.N., Titov S.A. and others Physical methods of control of raw materials and products in the meat industry M.: GIORD. - 2014

b) additional literature

1. Federal law from 28/12/2013 № 412-FL "On the accreditation of the national accreditation system"
2. Federal law from 27/12/2002 № 184-FL "On Technical Regulation"
3. Federal Law №102-FL of 26/06/2008 "On ensuring the uniformity of measurements" (as amended on July 13, 2015)
4. Federal Law of 02/01/2000 №29-FL "Quality and food safety" (as amended on July 13, 2015).
5. Federal Law of 06/29/2015 №162-FL "Standardization in the Russian Federation."
6. Federal Law №2300-1 07/02/1992 "Protection of Consumers' Rights (as amended on July 13, 2015).
7. Presidential Decree of 24.01.2011, №86 «About the Unified National Accreditation System" (as amended on October 28, 2015).
8. Technical Regulations of of the Customs Union 022/2011 "On food safety"
9. GOST R ISO 9001 - 2015 Quality Management System. Requirements: National Standard of the Russian Federation / Federal Agency on Technical Regulating and Metrology. - M.: Tehnormativ, 2015.
10. GOST 1.1 The Interstate system for standardization. Terms and Definitions
11. GOST R 1.2. Standardization in the Russian Federation. national standards of the Russian Federation. Rules of development, approval, renewal and cancellation
12. GOST R 1.4. Standardization in the Russian Federation. Standards organizations. General provisions
13. GOST R 1.5 Standardization in the Russian Federation. national standards of the Russian Federation. Rules for the structure, presentation, design and designations
14. GOST R 1.8 Standardization in the Russian Federation. interstate standards. Rules of the Russian Federation works on the development, application, renewal and termination of application
15. GOST R 1.9 Standardization in the Russian Federation. Mark of conformity to national standards of the Russian Federation. Picture. The order of application
16. GOST 1.12 Standardization in the Russian Federation. Terms and Definitions
17. I. Lifits Standardization, Metrology and Certification: Textbook for universities. - 6 th ed., Revised. And add. - M.: Yurayt-2015 - 350 p.:

18. V. Versan Technical regulation: the theory and practice-M.: JSC "Publishing house" Economy ", 2011
19. N. Dunchenko Quality management in the food industry: A manual for schools. - 3rd Ed. - Moscow: Dashkov i K, 2014. - 212 p.

10. Methodical instructions for students on mastering the discipline (module)

Starting to study the discipline "Innovative technologies in standardization", the student must carefully read the thematic lesson plan and the list of recommended literature. The level and depth of mastering the discipline depends on active and systematic work in lectures and practical exercises. In this process, independent work is important, aimed at involving the student in independent cognitive activity and the formation of methods for organizing such activities in order to form independent thinking, abilities for professional self-development, self-improvement and self-realization in modern conditions of socio-economic development. The main types of classroom work of students are lectures and practical classes.

During the lecture, the teacher expounds and explains the basic, most complex concepts, as well as the corresponding theoretical and practical problems, gives assignments and recommendations for practical exercises, as well as instructions for students to carry out independent work.

The objectives of the lectures are:

- familiarizing students with the goals, objectives and structure of the discipline, its place in the system of sciences and links with other disciplines;
- a short, but essentially, presentation of a complex of basic scientific concepts, approaches, methods, principles of this discipline;
- a summary of the most significant provisions, the disclosure of particularly complex, topical issues.

When taking the lecture notes, it is necessary clearly record the heading of the material - the delimitation of sections, topics, questions, paragraphs, etc. It is imperative to make special notes, for example, in cases where any definition, position, conclusion remained unclear, dubious. Sometimes the student does not have time to write down important information in the synopsis. Then it is necessary to make the appropriate notes in the text, so as not to forget, to fill in this information in the future. A well-made lecture notes will help the student in the process of independent work and in preparation for passing the test with an assessment.

The objectives of the practical lessons: to consolidate the theoretical knowledge gained by the student at lectures and because of independent study of the relevant sections of the recommended literature. The topics of the practical lessons are communicated to the students in advance so that they have the opportunity to prepare and work out the relevant theoretical issues of the discipline. At the beginning of each practical lesson, the teacher: - briefly brings the goals and objectives of the lesson to the students, drawing their attention to the most difficult questions on the topic under study; - conducts an oral survey of students.

In practical classes, students present independently prepared reports, including in the form of presentations, which are made in MS PowerPoint, outline new information and discuss these reports. The teacher in this process can act as a consultant or moderator. Based on the results of lectures and practical exercises, the teacher exposes the points received by the student, according to the assessment criteria. The absence of a student in the classroom or his inactive participation

in them can be compensated for by independently completing additional tasks and submitting them for verification to the teacher within the time frame set by him.
In modern conditions, the student is faced with an important task - to learn how to work with arrays of information. Students need to develop the ability and need to use the available information opportunities and resources to search for new knowledge and disseminate it. Students need to learn how to manage their research and cognitive activities in the "information - knowledge - information" system. First of all, to achieve this goal, the university organizes independent work of students. In addition, modern teaching assumes that the student spends a significant part of the time in mastering the academic discipline on his own. It is generally accepted that such a teaching method should contribute to the creative mastering of special knowledge and skills by students. The student's independent work is very diverse and meaningful. It includes the following types of activities:
- independent search, analysis of information and study of educational material;
- preparation for oral questioning (a list of typical questions for current control
- preparation of reports (an indicative list of topics for reports below).

The systematic nature of classes presupposes an even distribution of the volume of work during the entire period of mastering the discipline provided by the curriculum. This approach allows you to avoid a lack of time, overload, rush, etc. in the final period of studying the discipline. Consistency of work means continuity and logic in mastering knowledge of the discipline. This principle was originally laid down in the curriculum when determining the order of study of disciplines. A similar approach is used when determining the sequence in the study of topics in the discipline. The final stage of independent work is preparation for passing the test with an assessment in the discipline, which implies the integration and systematization of all the knowledge acquired during the study of the academic discipline. A test with an assessment (intermediate certification based on the results of mastering a discipline) allows you to determine the level of mastering of competencies by a student during the period of study of a given discipline.

11. Fund of assessment tools for intermediate certification of students in the discipline (module)

The level and quality of knowledge of students are assessed according to the results of entrance control, current monitoring of progress and intermediate certification based on the results of mastering the discipline in the form of a credit with an assessment.

The current control of students' progress includes oral interrogations, reports on discipline topics, protection of laboratory work. Oral questioning is carried out in practical classes in order to control the assimilation of the theoretical material presented in the lectures. The list of questions is determined by the level of training of the study group, as well as the individual characteristics of the students. As an independent work, the student is given topics for reports for use in practical classes. The report is designed to develop the ability to perceive, analyze, critical thinking, systematize information from the field of professional activity and practice the skills of a competent and logical presentation of the material.

Passport of the fund of assessment tools by discipline «Innovation Technologies In Standardization»

Direction / Specialty: 27.03.01 Standardization and Metrology
Discipline: **Innovation Technologies in Standardization**

Controlled competence code or part thereof	Supervised discipline section	FES (forms of control of the level of development of BEP)											Points section
		Classroom work						Independent work				Exam / Pass	
		Interview	Test	Colloquium	Test work	LW execution	Work in class	Homework performance	Abstract	Execution SGW	Execution CW		
GPC -3 GPC -4	**Section 1:**Principles of standardization						5						5
GPC -6 PC -3	**Section 2:**Technology and scientific and technological progress			5			5						10
GPC -5 GPC -4	**Section 3:** Technical regulation in the development of scientific and technical innovation in the agro-industrial complex.	5					5		10				20

GPC -3 GPC -4	**Section 4:**System analysis of the effectiveness of technological innovation			5			5		10				15
GPC -5 GPC -6	**Section 5:** Organization of the production process at the enterprise	5					5		10				20
PC -3	**Section 6:** Creation of a business plan for the enterprise			5			5						10
	Total											20	80
												100	

QUESTIONS FOR INDEPENDENT WORK

1. The concept of development of Russian Federation standardization
2. The legislative and regulatory framework of the national standardization system
3. Normative and legal acts in standardization of the Russian Federation Governmen
4. Organization of draft national standards expertise
5. Technical committees for standardization and coordination of their activities
6. Harmonization of national standards with international ones
7. International standardization. International Organization for Standardization: ISO, IEC.
8. Interstate system of standardization. Interstate standards
9. Regional system of standardization. European standards
10. Activities of the United Nations Economic Commission of European in standardization
11. Intersectoral Council of standardization
12. Contemporary Issues in Standardization
13. Improving the system of standardization in the area of the legislation
14. Application of international and regional standards for conformity assessment of products
15. Development of national (preliminary national) standards
16. Types of standardization documents.

An approximate subject coursework projects (works)

1. Objects of standardization in the food industry.
2. The voluntary nature of standards.
3. Inter-State and national standards.
4. Types of regulations stipulated by the legislation of the Russian Federation.
5. Analysis of federal laws governing relations in the field of standardization and food safety.
6. Principles of standardization in the field of technology development of standards.
7. Technical committees for standardization.
8. Stages of development and approval of national standard.
9. Updated national standard.
10. Phases of work on updating the national standard.
11. Procedure for amending the national standards.
12. National standard. cases of revision and amendment.
13. Repeal of the national standard. Stages of works to repeal.
14. List documents in the field of standardization.
15. Legality of application of technical documents in the food industry.
16. Russian classifiers used when working with documents for standardization.
17. The main elements of the national standards.
18. The specifics of the design standards for the type of specification.
19. Standard structural elements.

Questions for practical classes

1. The role of standardization in quality management products
2. Priorities for the interstate standardization
3. Technical regulation requirements of the Customs Union
4. Requirements for technical level and quality of products
5. The value of standardization in enhancing the competitiveness of enterprises
6. Unification of development processes and of storage standards
7. Development of national standardization system and improving legislative framework
8. Ensuring the safety and improving the competitiveness of agro-industrial complex

9. The development of standards based on the generally accepted principles of international standardization
10. The development of standardization in view of the society demands and the market economy
11. Application of methods and tools of standardization
12. Development of common products classifications. Cataloging products
13. Development of documents in standardization
14. Standards of organizations

Test for standardization

1. The goal of standardization:
    a. Increasing of the level of life safety and citizens' health
    b. Ensuring of competitiveness and the quality of products
    c. Using of forms of compliance confirmation
2. A national standard is:
    a. A standard adopted by an international organization
    b. A standard approved by the national authority of the Russian Federation in standardization
    c. A standard adopted by an regional organization in standardization
3. Products safety is:
    a. A form of confirmation of conformity of products
    b. A document which certify the conformity of manufactured products
    c. A condition in which there is no unacceptable risk
4. Products is:
    a. The result of activity presented in material form and designed for further use for economic and other purposes
    b. A natural product
    c. Natural (identical natural) biologically active substance
5. The introduction of technical regulation in the Russian Federation indicates:
    a. The establishment of mandatory certification
    b. Technical regulations acquire the status of laws
    c. Liability issues on confirmation of conformity are passed directly on manufacturer's products
6. The major factors that define the quality of the product are:
    a. Used to create goods raw materials
    b. Production technology
    c. A certificate of conformity for the quality management system
7. Standardization is:
    a. Activities on the establishment of rules of performance for the voluntary multiple use
    b. The legal regulation of relations in the field of establishment, application and use of mandatory requirements
    c. The direction for the development of normative documents
8. Goals of standardization:
    a. Ensuring interoperability and technical compatibility.
    b. Improving the competitiveness of products
    c. Ensuring scientific and technical progress
9. Documents in the field of standardization:
    a. Technical regulations

b. Standards organizations
c. Russian classification of technical economic and social information

10. The legislative base for standardization is:
    a. The law "On standardization"
    b. The law "On technical regulation"
    c. The law "On protection of consumers' rights
11. Information support of standardization is:
    a. Information index of technical regulations and standards
    b. Federal Fund of standards
    c. The national classification of technical, economic and social information
12. A leading authority in the field of international standardization is:
    a. Rosstandart of the Russian Federation
    b. International Organization for Standardization (ISO)
    c. The European Committee for Standardization
13. The national harmonization of standards is:
    a. The development of international standardization
    b. Removing barriers to international trade
    c. Raising the level of standards
14. The mandatory requirements of the technical regulations include:
    a. The safety of products and processes for of citizens' life, health, property and the environment
    b. Ensuring the uniformity of measurements
    c. Quality assurance of products, works and services in accordance with the level of development of science, engineering and technology
15. Federal law "On technical regulation" was adopted in:
    a. 2002
    b. 2005
    c. 2004
16. Objects of standardization are:
    a. Products
    b. The process
    c. Interchangeability
17. The technical regulation is carried out in accordance with the principles of:
    a. The independence of certification bodies, certification bodies from manufacturers, sellers, executors and purchasers;
    b. The permissibility of combining the powers of bodies of state supervision and certification body;
    c. Unity of application of the technical regulations, regardless of species or features of transactions

Table of points and scores

Evaluation							
ECTS	F	FX	E	D	C	B	A
ECTS	2		3	3+	4	5	5+

The score on the BRS	0-30	31-50	51-60	61-68	69-85	86-94	95-100

The program is compiled in accordance with the requirements of ES HE RUDN

Developers:

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Name of the department signature initials, surname