Federal State Autonomous Educational Institution of Higher Education
Peoples' Friendship University of Russia named after Patrice Lumumba
RUDN University

educational division (faculty/institute/academy) as higher education programme developer

COURSE SYLLABUS

POSTHARVEST PROCESSING

course title

Recommended by the Didactic Council for the Education Field of:

35.04.04 AGRONOMY

field of studies / speciality code and title

The course instruction is implemented within the professional education programme of higher education:

GENERAL AGRICULTURE

higher education programme profile/specialisation title

2026

1. COURSE GOAL(s)

The course "Postharvest Processing" is part of the Master's programme "General Agriculture" in the field of study 35.04.04 "Agronomy" and is studied in the 4th semester of the 2nd year. The discipline is implemented by the Agrobiotechnology Department. The discipline consists of 7 sections and 8 topics and is aimed at studying modern methods of determining the quality of grain, vegetables, and fruits, traditional and advanced methods of processing and storage of plant raw materials, and the use of standards and regulatory and technical documentation in professional activities.

The course aims to:

1. Address the development of students' awareness in modern quality assessment methods and processing/storage technologies for crop products and understanding of regulatory standards;
2. Familiarize students with the theoretical background, terminology, and concepts of postharvest physiology, grain mass properties, baking technology, and conservation methods;
3. Deepen students' knowledge in standardization, certification, and natural loss calculations for stored agricultural commodities;
4. Enhance students' skills in applying postharvest processing technologies and organizing production workflows through practical tasks and industry case studies.

The goal of mastering the discipline is to form the necessary theoretical knowledge about the principles of storage and processing of crop production and the main technological processes in the milling, baking, and canning industries; to acquire practical skills in organizing the process of processing crop production. This subject provides an advanced study of postharvest handling and processing strategies for their implementation in the agro-industrial sector.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course " Postharvest Processing " is aimed at the development of the following competences (or parts thereof) in students:

Table 2.1. List of competences that students acquire through the course study

Competence code	**Competence descriptor**	**Competence formation indicators** (within this course)
GC-1	Ability to carry out critical analysis of problematic situations based on a systemic approach and to develop an action strategy	GC-1.2 Uses a systemic approach to solve assigned tasks;
GC-3	Ability to organize and lead the work of a team, developing a team strategy to achieve the set goal	GC-3.1 Develops a cooperation strategy and on its basis organizes the work of the team to achieve the set goal;
		GC-3.2 Plans team work, distributes assignments and delegates authority to team members, organizes discussion of different ideas and opinions;

Competence code	Competence descriptor	Competence formation indicators (within this course)
GPC-1	Ability to solve tasks related to the development of the professional field and/or organization based on analysis of achievements in science and production	GPC-1.1 Demonstrates knowledge of main methods for analyzing achievements in science and production in agronomy;
		GPC-1.2 Uses methods for solving tasks related to the development of agronomy based on search and analysis of modern achievements in science and production;
		GPC-1.3 Applies available technologies, including information and communication technologies, to solve tasks of professional activity in agronomy;
GPC-5	Ability to carry out feasibility studies of projects in professional activities	GPC-5.1 Masters methods of economic analysis and accounting of project indicators in agronomy;
		GPC-5.2 Analyzes main production and economic indicators of the project in agronomy;
		GPC-5.3 Develops proposals to improve the efficiency of the project in agronomy;
GPC-6	Ability to manage teams and organize production processes	GPC-6.1 Knows how to work with information systems and databases on personnel management;
		GPC-6.2 Determines personnel tasks of a structural unit based on the goals and strategy of the organization;
		GPC-6.3 Applies methods of managing interpersonal relations, team building, developing leadership and execution, identifying talents, determining job satisfaction;
PC-3	Ability to identify directions for improving and increasing the efficiency of crop production technologies based on scientific achievements and best practices of domestic and foreign producers	**PC-3.1** Identifies promising directions for improving the efficiency of crop production;
		PC-3.2 Carries out operational regulation of crop production processes;

3.COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course refers to the core component of Block 1 "Disciplines (Modules)" of the higher educational programme curriculum.

Within the higher education programme, students also master other disciplines and/or internships that contribute to the achievement of the expected learning outcomes as results of the course study.

Table 3.1. The list of the higher education programme components/disciplines that contribute to the achievement of the expected learning outcomes as the course study results

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
GC-3	Ability to organize and lead the work of a team, developing a team strategy to achieve the set goal	Management; Marketing	
GC-1	Ability to carry out critical analysis of problematic situations based on a systemic approach and to develop an action strategy	Information Technology; Pests and Diseases; Soil Fertility Management; Crop Production; Management; Marketing; Technological Training; Scientific Research Work	
GPC-6	Ability to manage teams and organize production processes	Technological Training	
GPC-1	Ability to solve tasks related to the development of the professional field and/or organization based on analysis of achievements in science and production	Crop Production; Soil Fertility Management; Pests and Diseases; Information Technology; Scientific Research Work; Technological Training	
GPC-5	Ability to carry out feasibility studies of projects in professional activities	Mechanization of Crop Production	
PC-3	Ability to identify directions for improving and increasing the efficiency of crop production technologies based on scientific achievements and best practices of domestic and foreign producers	Scientific Research Work; Technological Training; Plant Protection; Crop Production; Breeding and Seed Production	

* To be filled in according to the competence matrix of the higher education programme.

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course " Postharvest Processing " amounts to **3 credits (108 academic hours)**.

*Table 4.1. Types of academic activities during the periods of higher education programme mastering (**full-time training)****

Type of academic activities		Total academic hours	Semesters/training modules
			1
Contact academic hours		*20*	*20*
including:			
Lectures (LC)		10	10
Lab work (LW)		0	0
Seminars (workshops/tutorials) (S)		10	10
Self-studies		*79*	*79*
Evaluation and assessment (exam/passing/failing grade)		*9*	*9*
Course workload	academic hours_	**108**	**108**
	credits	**3**	**3**

* To be filled in regarding the higher education programme correspondence training mode.

5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

Course module title	Course module contents (topics)	Academic activities types
Module 1: Basics of storage of crop production	Topic 1.1. Types of losses during storage and factors causing them .	LC, S
Module 2: Standardization of crop products	Topic 2.1. Standards and regulatory/technical documents, their categories. Methods for determining crop product quality	LC, S
Module 3: Storage of grain and seeds	Topic 3.1. Storage of grain and seeds. Grain mass and its main components. Physical characteristics of grain mass	LC, S

Course module title	Course module contents (topics)	Academic activities types
	Topic 3.2. Norms of natural loss during grain storage. Natural loss as an integral part of grain mass loss during postharvest processing and storage. Calculation of the coefficient of natural loss for seed grain	LC, S
Module 4: Basics of baking	Topic 4.1. Nutritional value of bread. Methods of bread production. Baking properties of wheat and rye flour	LC, S
Module 5: Methods of conservation of fruit and vegetable raw materials	Topic 5.1. Biochemical and chemical changes of plant raw materials during canning. Storage of raw materials and its preparation for canning	LC, S
Module 6: Raw material characteristics of grapes and main quality requirements	Topic 6.1. Microbiological and biochemical bases of winemaking. Main technological schemes for grape processing	LC, S
Module 7: Tea and main quality requirements	Topic 7.1. Raw materials for tea production. Chemical composition of tea. Tea leaf picking. Tea factories and tea classification	LC, S

* - to be filled in only for **full** -time training: *LC - lectures; LW - lab work; S - seminars.*

6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Classroom equipment and technology support requirements

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
Lecture	A lecture hall for lecture-type classes, equipped with a set of specialised furniture; board (screen) and technical means of multimedia presentations.	Set of specialised furniture; technical facilities: EPSON EB-965 multimedia projector, Laptop, internet access. Software: Microsoft

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
		products (OS, office applications package, including MS Office/Office 365, Teams, Skype)
Seminar	A classroom for conducting seminars, group and individual consultations, current and mid-term assessment; equipped with a set of specialised furniture and technical means for multimedia presentations.	Set of specialised furniture; technical facilities: EPSON EB-965 multimedia projector, Laptop, internet access. Software: Microsoft products (OS, office applications package, including MS Office/Office 365, Teams, Skype)
Self-studies	A classroom for independent work of students (can be used for seminars and consultations), equipped with a set of specialised furniture and computers with access to the electronic information and educational environment.	

* The premises for students' self-studies are subject to **MANDATORY** mention

7. RESOURCES RECOMMENDED FOR COURSE STUDY

Main readings:

1. Glukhikh, M. A. Technology of storage and processing of crop production / M. A. Glukhikh. — Saint Petersburg: Lan, 2024. — 128 p. — ISBN 978-5-507-47996-2. — Electronic text // Lan: electronic library system. — URL: https://e.lanbook.com/book/362765

2. Economy and organization of production of agro-industrial complex enterprises: teaching aid / compiled by N. V. Likholetova. — Persianovsky: Don SAU, 2024. — 181 p. — Electronic text // Lan: electronic library system. — URL: https://e.lanbook.com/book/459566

Additional readings:

1. Kostko, I. G. Methodological recommendations for studying the discipline "Storage and processing of crop production": methodological recommendations / I. G. Kostko, A. M. Spiridonov. — Saint Petersburg: SPbSAU, 2023. — 42 p. — Electronic text // Lan: electronic library system. — URL: https://e.lanbook.com/book/443714

2. Technology of storage of agricultural products. Grain masses, potatoes, fruits and vegetables: textbook / O. A. Zakharova, F. A. Musaev, D. E. Kucher, O. V. Cherkasov. — Ryazan: RGATU, 2022. — 215 p. — Electronic text // Lan: electronic library system. — URL: https://e.lanbook.com/book/264233

Internet sources

1. 1. **Electronic libraries (EL) of RUDN University and other institutions, to which university students have access on the basis of concluded agreements:**
   - RUDN Electronic Library System (RUDN ELS): https://mega.rudn.ru/MegaPro/Web

- EL "University Library Online": http://www.biblioclub.ru
- EL "Yurait": http://www.biblio-online.ru
- EL "Student Consultant": www.studentlibrary.ru
- EL "Znanium": https://znanium.ru/

Databases and search engines:

- Techexpert (information and reference system of GOSTs): http://www.cntd.ru/
- "Selkhoztehnika" (automated reference system): http://www.agrobase.ru
- Sage: https://journals.sagepub.com/
- Springer Nature Link: https://link.springer.com/
- Wiley Journal Database: https://onlinelibrary.wiley.com/
- Bibliometric database Lens.org: https://www.lens.org

*Training toolkit for self- studies to master the course *:*

1. The set of lectures on the course " Postharvest Processing ".

* The training toolkit for self- studies to master the course is placed on the course page in the university telecommunication training and information system under the set procedure.

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