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**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

INTERNSHIP SYLLABUS

Scientific research work

internship title

Internship

internship type

Recommended by the Didactic Council for the Education Field of:

35.04.04 AGRONOMY

field of studies / speciality code and title

The student's internship is implemented within the professional education programme of higher education:

INTEGRATED PLANT PROTECTION

higher education programme profile/specialisation title

1. INTERNSHIP GOAL(s)

The Scientific Research Work internship is part of the Master's program "Integrated Plant Protection" under the field of study 35.04.04 "Agronomy" and is conducted across the 1st, 2nd, 3rd, and 4th semesters of the 1st and 2nd years. The internship is delivered by the Agrobiotechnology Department.

The goal of the internship is to develop trainees' professional competencies necessary for a systematic approach to research activities, as well as to provide practical training for students to conduct independent research in higher education institutions and scientific centers.

2. REQUIREMENTS FOR LEARNING OUTCOMES

The Scientific Research Work internship is aimed at developing the following competencies (parts of competencies) in students:

Table 2.1. List of competences that students acquire during the internship

Competence code	Competence descriptor	Competence formation indicators (within this course)
GC-1	Able to carry out critical analysis of problem situations based on a systematic approach, develop an action strategy	GC-1.1 Performs search for necessary information, its critical analysis and generalizes the results of the analysis to solve the assigned task; GC-1.2 Uses a systematic approach to solve assigned tasks; GC-1.3 Develops a strategy for achieving the set goal as a sequence of steps, anticipating the result of each of them and assessing their impact on the external environment of the planned activities and on the relationship between the participants in these activities;
GC-2	Able to manage a project at all stages of its life cycle	GC-2.1 Develops a project concept within the defined problem, formulating the goal, objectives, relevance, significance, expected results and possible areas of their application; GC-2.2 Forms a schedule for the implementation of the project as a whole and a plan for monitoring its execution, organizes and coordinates the work of project participants; GC-2.3 Proposes possible ways (algorithms) for implementing the project results into practice (or implements it);
GC-6	Able to determine and implement priorities of own activity and ways of its improvement based on self-assessment	GC-6.1 Assesses own resources and their limits (personal, situational, temporal), optimally uses them for successful completion of the assigned task; GC-6.2 Plans professional trajectory taking into account the features of both professional and other types of activities and labor market requirements;
GC-7	Able to search for necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using	GC-7.1 Evaluates information, its reliability, builds logical conclusions based on incoming information and data; GC-7.2 Has practical experience in searching, perceiving, storing, analyzing, transmitting information and data using digital means, algorithms

Competence code	Competence descriptor	Competence formation indicators (within this course)
	algorithms when working with data obtained from various sources in order to effectively use the received information to solve problems, evaluate information, its reliability, build logical conclusions based on incoming information and data	and application programs in order to solve assigned tasks;
GPC-1	Able to solve problems of development of the field of professional activity and/or organization based on the analysis of scientific and production achievements	GPC-1.1 Demonstrates knowledge of the main methods of analysis of scientific and production achievements in agronomy; GPC-1.2 Uses methods for solving problems of agronomy development based on search and analysis of modern scientific and production achievements; GPC-1.3 Applies available technologies, including information and communication technologies, to solve professional tasks in agronomy;
GPC-3	Able to use modern methods of solving problems when developing new technologies in professional activities	GPC-3.1 Analyzes methods and ways of solving problems related to the development of new technologies in agronomy; GPC-3.2 Uses information resources, achievements of science and practice when developing new technologies in agronomy;
GPC-4	Able to conduct scientific research, analyze results and prepare reporting documents	GPC-4.1 Analyzes methods and ways of solving research problems; GPC-4.2 Uses information resources, scientific, experimental and instrumental base for conducting research in agronomy; GPC-4.3 Formulates the results obtained during the solution of research problems;
GPC-7	Able to master the tools for working with large arrays of structured and unstructured information, use modern digital methods of processing, analysis, interpretation and visualization of data in order to solve assigned tasks of professional and research activities in the field of agronomy	GPC-7.1 Masters the tools for working with large arrays of structured and unstructured information; GPC-7.2 Uses modern digital methods of processing, analysis, interpretation and visualization of data in order to solve assigned tasks;
PC-1	Able to collect, process, analyze and systematize scientific and technical information, domestic and foreign experience in the field of agronomy	PC-1.1 Performs critical analysis of the information received; PC-1.2 Conducts information search on improving technologies for growing and protecting crops, including using the Internet;

Competence code	Competence descriptor	Competence formation indicators (within this course)
PC-2	Able to develop methodologies for conducting experiments, master new research methods	PC-2.1 Develops methodologies for conducting experiments; PC-2.2 Applies modern types and methodologies of observations and accounting in field experiments;
PC-3	Able to organize, conduct and analyze the results of experiments (field trials)	PC-3.2 Organizes field experiments to assess the effectiveness of innovative technologies under production conditions;
PC-5	Able to prepare scientific and technical reports, reviews and scientific publications based on the results of conducted research	PC-5.1 Develops a research program to study the effectiveness of agronomic techniques; PC-5.2 Uses methods of mathematical statistics when processing data and preparing a report;

3. INTERNSHIP IN HIGHER EDUCATION PROGRAMME STRUCTURE

The Scientific Research Work internship belongs to the core component of Block 1 "Disciplines (modules)" of the higher education programme curriculum.

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

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

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
GC-1	Able to carry out critical analysis of problem situations based on a systematic approach, develop an action strategy	Mathematical Modeling and Design; Information Technology; Information Databases; Scientific research work; Scientific and Research Practice;	
GC-2	Able to manage a project at all stages of its life cycle	Organization of Integrated Plant Protection Systems; Plant Protection in Organic Farming**; Scientific research work; Scientific and Research Practice;	Undergraduate practice/Pre-diploma practice;
GC-6	Able to determine and implement priorities of own activity and ways of its improvement based on self-assessment	Manuscript Design**; History and methodology of scientific Agronomy; Instrumental methods of research; Information Technology; Forecast of Development of Agricultural Pests and	Undergraduate practice/Pre-diploma practice;

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
		Diseases**; Pest Risk Analysis**; Scientific research work; Scientific and Research Practice;	
GC-7	Able to search for necessary sources of information and data, perceive, analyze, memorize and transmit information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the received information to solve problems, evaluate information, its reliability, build logical conclusions based on incoming information and data	History and methodology of scientific Agronomy; Scientific research work; Scientific and Research Practice;	
GPC-1	Able to solve problems of development of the field of professional activity and/or organization based on the analysis of scientific and production achievements	Mathematical Modeling and Design; Instrumental methods of research; Bacterial Diseases; Virology; Information Technology; Biological Method of Plant Protection; Organization of Integrated Plant Protection Systems; Scientific research work; Scientific and Research Practice;	
GPC-3	Able to use modern methods of solving problems when developing new technologies in professional activities	Instrumental methods of research; Information Technology; Organization of Integrated Plant Protection Systems; Scientific research work; Scientific and Research Practice;	
GPC-4	Able to conduct scientific research, analyze results and prepare reporting documents	Mathematical Modeling and Design; Instrumental methods of research; Bacterial Diseases; Virology; Biological	Undergraduate practice/Pre-diploma practice;

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
		Method of Plant Protection; Organization of Integrated Plant Protection Systems; Scientific research work; Scientific and Research Practice;	
GPC-7	Able to master the tools for working with large arrays of structured and unstructured information, use modern digital methods of processing, analysis, interpretation and visualization of data in order to solve assigned tasks of professional and research activities in the field of agronomy	Instrumental methods of research; Information Technology; Scientific research work; Scientific and Research Practice;	
PC-1	Able to collect, process, analyze and systematize scientific and technical information, domestic and foreign experience in the field of agronomy	History and methodology of scientific Agronomy; Information Technology; Forecast of Development of Agricultural Pests and Diseases**; Pest Risk Analysis**; Organization of Integrated Plant Protection Systems; Scientific research work; Scientific and Research Practice;	Undergraduate practice/Pre-diploma practice;
PC-2	Able to develop methodologies for conducting experiments, master new research methods	Molecular Methods of Diagnostics**; Instrumental methods of research; Biological Method of Plant Protection; Organization of Integrated Plant Protection Systems; Plant Protection in Organic Farming**; Scientific research work; Scientific and Research Practice;	
PC-3	Able to organize, conduct and analyze the results of experiments (field trials)	Mathematical Modeling and Design; Biological Method of Plant Protection; Organization	

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
		of Integrated Plant Protection Systems; Scientific research work; Scientific and Research Practice;	
PC-5	Able to prepare scientific and technical reports, reviews and scientific publications based on the results of conducted research	Scientific and Research Practice; Mathematical Modeling and Design; Manuscript Design**; Molecular Methods of Diagnostics**; History and methodology of scientific Agronomy; Fundamentals of Scientific Communication**; Scientific research work;	Undergraduate practice/Pre-diploma practice;

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

4. INTERNSHIP WORKLOAD

The total workload of the Scientific Research Work internship is 28 credits (1008 academic hours).

5. INTERNSHIP CONTENTS

*Table 5.1. Internship contents**

Modules	Contents (topics, types of practical activities)	Workload, academic hours
Module 1. Preparatory Stage	Topic 1.1. Working meeting at the department	4
	Topic 1.2. Familiarization with the scientific and publishing activities of the Department of Soil Science, General Agriculture and Crop Production named after V.D. Mukha	56
	Topic 1.3. Study and analysis of scientific sources on the chosen topic, determination of its development level in scientific literature	106
	Topic 1.4. Visit to the university scientific library. Work with electronic databases, educational resources, book provision cards, etc.	156
	Topic 1.5. Adjustment of the research plan and experiment scheme together with the scientific supervisor	56
	Topic 1.6. Selection and procurement of necessary materials for the experiment (seeds, fertilizers, biological products) considering available farm resources	56
Module 2. Practical Stage	Topic 2.1. Safety briefing at the workplace. Inspection of the farm and experimental plot	8

Modules	Contents (topics, types of practical activities)	Workload, academic hours
	Topic 2.2. Analysis of the economic and research activities of the scientific institution (baseline economics)	106
	Topic 2.3. Conducting the research (experiment fixation; conducting accompanying observations and accounting)	106
	Topic 2.4. Testing the proposed hypothesis	62
Module 3. Interim Assessment	Topic 3.1. Presentation of research results. Collection, processing and analysis of collected materials and primary documentation	156
	Topic 3.2. Writing the report, preparing the presentation	106
	Topic 3.3. Internship admission interview, analysis of the internship report content	6
	Topic 3.4. Scientific Research Practice Conference	6
Writing an internship report		9
Preparing for defence and defending the internship report		9
TOTAL:		1008

* The contents of internship through modules and types of practical activities shall be FULLY reflected in the student's internship report.

6. INTERNSHIP EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

The place of the Scientific Research Work internship and its specific content are determined by the specifics of the Master's program and the student's scientific interests. Depending on this, the internship can be conducted at an enterprise (advanced farms of various ownership forms), an institution, an organization, or within a structural division of the university (experimental base of the faculty, department branches, production units).

The infrastructure and technical support necessary for the internship implementation include: laboratories / specially equipped classrooms / experimental plots / measuring and computing complexes / vehicles / industrial equipment and devices / facilities that comply with current sanitary and fire safety standards.

The SAFETY REQUIREMENTS at the enterprise, workplace (including the department of RUDN University) and during the work with certain production/laboratory equipment incorporate the standard safety regulations and briefing procedures specified by the hosting organization and university guidelines.

7. INTERNSHIP LOCATION AND TIMELINE

The internship can be carried out at the structural divisions of RUDN University or at Moscow-based organizations (stationary), as well as at bases located outside Moscow (field/travel).

The internship at an external organization (outside RUDN University) is legally arranged on the grounds of an appropriate agreement, which specifies the terms, place and conditions for an internship implementation at the organization.

The period of the internship, as a rule, corresponds to the period indicated in the training calendar of the higher education programme. However, the period of the internship can be rescheduled upon agreement with the Department of Educational Policy and the Department for the Organization of Internship and Employment of RUDN students.

8. RESOURCES RECOMMENDED FOR INTERNSHIP

Main readings:

1. Be-Bienko, G.Ya. *General Entomology: Textbook*. — St. Petersburg: Prospekt Nauki, 2008. — 486 p.
2. *Plant Protection from Pests* / Ed. by N.N. Tretyakov, V.V. Isaichev. — St. Petersburg-Moscow-Krasnodar, 2012. — 528 p.
3. *Plant Quarantine* / Ed. by A.S. Vasyutin. — Moscow, 2002. — 536 p.
4. *List of Pests, Plant Disease Pathogens, and Weeds of Quarantine Importance for the Russian Federation*. Ministry of Agriculture, 2003. — 6 p.
5. *Biology of Quarantine Harmful Organisms (Weeds, Pests and Diseases)* [Electronic resource]: lecture course / compiled by O.B. Kotelnikova. — Kursk: KSAU Publ., 2008. — 160 p.
6. *Phytosanitary Control and Supervision in Oryol and Kursk Regions* / Ed. by E.N. Dubrovina. — Oryol: Operativnaya Poligrafiya, 2008. — 461 p.

Additional readings:

1. Aleksandrov, I.N., Dudchenko, I.P. Diplodia Corn Disease // *Plant Protection and Quarantine*. — 2002. — No. 1. — P. 24.
2. Baranchikov, Y.N., et al. Complex Monitoring of Siberian Silk Moth Population // *Plant Protection and Quarantine*. — 2006. — No. 5. — P. 39.
3. Vasyutin, A.S., et al. *Plant Quarantine in the Russian Federation*. — Moscow: Kolos, 2001. — 375 p.
4. *Harmful Organisms of Quarantine Importance for Europe* (Translated from English). — Moscow: Kolos, 1996. — 912 p.
5. Vasyutin, A.S. Testing Soil Samplers in Potato Cyst Nematode Foci // *Plant Protection and Quarantine*. — 2003. — No. 8. — P. 32.
6. Varshalovich, A.A. *Quarantine and Other Species of Beetles-Pests of Industrial Raw Materials and Food Stocks*. — Moscow: Kolos, 1975. — 275 p.
7. Mordkovich, Ya.B., Sokolov, E.A. Detection of Khapra Beetle in Storage Facilities // *Plant Protection and Quarantine*. — 2000. — No. 12. — P. 26.
8. Dulova, E.V. Quarantine Miners // *Plant Protection and Quarantine*. — 2005. — No. 5. — P. 34.
9. Drugova, E.V., Nesterov, V.A. Features of Phytosanitary Control for Greenhouse Crop Pests // *Plant Protection and Quarantine*. — 2004. — No. 2. — P. 44.
10. Zapolovsky, S.A., Derega, A.A. Common Ragweed in Zhytomyr Region // *Plant Protection and Quarantine*. — 2004. — No. 11. — P. 38.
11. Zagulyaev, A.K. *Moths and Pyralids — Pests of Grain and Food Stocks*. — Moscow-Leningrad: Nauka, 1965. — 167 p.
12. Zakladnoy, G.A., Ratanova, V.F. *Pests of Grain Stocks and Control Measures*. — Moscow: Kolos, 1973. — 250 p.
13. Shkalikov, V.A., et al. *Plant Protection from Diseases*. — Moscow: Kolos, 2001. — 248 p.

14. Ivanova, N.A. Quarantine Grapevine Diseases // *Plant Protection and Quarantine*. — 2009. — No. 2. — P. 40.
15. Izhevsky, S.S. *Introduction and Application of Entomophages*. — Moscow: Agropromizdat, 1990. — 223 p.
16. Isaichev, V.V., et al. *Plant Protection*. — Moscow: Kolos, 2002.
17. *Quarantine and Phytosanitary Status of CIS and Baltic States as of 01.01.2000*. — Moscow, 2000. — 267 p.
18. Karachaeva, E.I. Black Pine Sawyer // *Plant Protection and Quarantine*. — 2011. — No. 8. — P. 37.
19. Kvashnina, N.A. Monitoring of Fire Blight Foci in Southern Russia // *Plant Protection and Quarantine*. — 2010. — No. 6. — P. 40.
20. Kuleshova, Y.G. Plum Pox Virus in the Russian Federation // *Plant Protection and Quarantine*. — 2010. — No. 10. — P. 35.
21. Kulinich, O.A. Pine Wood Nematode // *Plant Protection and Quarantine*. — 2010. — No. 7. — P. 36.
22. Mordkovich, Ya.B. Common Problems Require Joint Solutions // *Plant Protection and Quarantine*. — 2010. — No. 4. — P. 34.

Internet sources

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 "Yurayt": <http://www.biblio-online.ru>
 - EL "Student Consultant": www.studentlibrary.ru
 - EL "Znaniy": <https://znaniy.ru/>
2. Databases and search engines:
 - Sage: <https://journals.sagepub.com/>
 - Springer Nature Link: <https://link.springer.com/>
 - Wiley Journal Database: <https://onlinelibrary.wiley.com/>
 - Scientometric database Lens.org: <https://www.lens.org>

The training toolkit and guidelines for a student to do an internship, keep an internship diary and write an internship report:*

1. Safety regulations to do the internship (safety awareness briefing).
2. Machinery and principles of operation of technological production equipment used by students during their internship; process flow charts, regulations, etc. (if necessary).
3. Guidelines for keeping an internship diary and writing an internship report.

*The training toolkit and guidelines for the internship are placed on the internship page in the university telecommunication training and information system under the set procedure.

DEVELOPERS:

Director of the
Agrobiotechnology Department

position, educational department

signature

Pakina E.N.

name and surname.

HEAD OF EDUCATIONAL DEPARTMENT:

Director of the
Agrobiotechnology Department

educational department

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**HEAD OF
HIGHER EDUCATION PROGRAMME:**

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Agrobiotechnology Department

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