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Информация о владельце:
ФИО: Ястребов Олег Александрович
Должность: Ректор
Дата подписания: 10.09.2024 10:27:02
Уникальный программный ключ:
ca953a0120d891083f939673078ef1a989dae18a

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

Agrarian and Technological Institute

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

COURSE SYLLABUS

MECHANIZATION OF PLANT GROWING

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 AGRONOMY

higher education programme profile/specialisation
title

1. THE GOAL OF MASTERING THE DISCIPLINE

The course "Mechanization of Crop Production" is included in the master's program "General Agronomy" in the direction 35.04.04 "Agronomy" and is studied in the 1st semester of the 1st year. The discipline is implemented by the Department of Transport Engineering and Technology. The discipline consists of 9 sections and 32 topics and is aimed at studying mechanized technologies and technical means of their implementation in the crop production industry.

The purpose of mastering the discipline is to develop students' general professional and professional competencies in the field of mechanization of technological processes for cultivating agricultural crops and producing plant products.

2. REQUIREMENTS TO THE RESULTS OF MASTERING THE DISCIPLINE

Mastering the discipline "Mechanization of plant growing" is aimed at developing the following competencies (parts of competencies) in students:

Table 2.1. List of competencies developed in students while mastering the discipline (results of mastering the discipline)

Cipher	Competence	Indicators of Competence Achievement (within the framework of this discipline)
UK-2	Able to manage a project at all stages of its life cycle	UK-2.1 Develops a project concept within the framework of the identified problem, formulating the goal, objectives, relevance, significance (scientific, practical, methodological and other depending on the type of project), expected results and possible areas of their application;
OPK-5	Capable of carrying out feasibility studies of projects in a professional manner activities	OPK-5.2 Analyzes the main production and economic indicators of a project in agronomy;
PC-1	Capable of organizing experiments (field trials) to assess the effectiveness of innovative technologies (elements of technology), varieties and hybrids in production conditions	PC-1.1 Draws up a research program to study the effectiveness of innovative technologies (elements of technology), varieties and hybrids, develops methods for conducting experiments, masters new research methods;

3. PLACE OF DISCIPLINE IN THE STRUCTURE OF EDUCATIONAL EDUCATION

The discipline "Mechanization of plant growing" is a compulsory part of block 1 "Disciplines (modules)" of the educational program of higher education.

As part of the higher education program, students also master other disciplines and/or practices that contribute to the achievement of the planned results of mastering the discipline "Mechanization of plant growing".

Table 3.1. List of components of the educational program of higher education that contribute to the achievement of the planned results of mastering the discipline

Cipher	Name of competence	Preceding courses/modules, practices*	Subsequent disciplines/modules, practices*
UK-2	Capable of managing		Soil Fertility Management;

Cipher	Name of competence	Preceding courses/modules, practices*	Subsequent disciplines/modules, practices*
	project at all stages of its life cycle		Crop Production; Technological Training; Undergraduate practice / Pre-graduate practice;
OPK-5	Capable of carrying out feasibility studies of projects in professional activities		Postharvest Management;
PC-1	Capable of organizing experiments (field trials) to assess the effectiveness of innovative technologies (elements of technology), varieties and hybrids in production conditions		Research work; Technological Training; Undergraduate practice / Pre-graduate practice; Crop Production; Pests and Diseases; Breeding and Seed Production; Plant Protection; Soil Fertility Management;

* - filled in in accordance with the competency matrix and the SUP OP VO

** - elective disciplines/practices

4. SCOPE OF THE DISCIPLINE AND TYPES OF STUDY WORK

The total workload of the discipline “Mechanization of Crop Production” is “3” credit units.

Table 4.1. Types of educational work by periods of mastering the educational program of higher education for full-time education.

Type of academic work	TOTAL,ac.h.		Semester(s)
			1
<i>Contact work, academic hours</i>	51		51
Lectures (LC)	17		17
Laboratory work (LW)	34		34
Practical/seminar classes (SZ)	0		0
<i>Independent work of students, academic hours</i>	39		39
<i>Control (exam/test with assessment), academic hours</i>	18		18
General complexity of the discipline	ac.h.	108	108
	credit. ed.	3	3

5. CONTENT OF THE DISCIPLINE

Table 5.1. Contents of the discipline (module) by types of academic work

Section number	Name of the discipline section	Section (Topic) Contents		Type of academic work*
Section 1	General Provisions	1.1	History of the development of mechanization in agriculture	OK
		1.2	Integrated mechanization of crop production	OK
Section 2	Energy resources in crop production	2.1	Classification of agricultural tractors	OK
		2.2	General structure of agricultural tractors	LR
		2.3	Self-propelled agricultural machinery	LR
Section 3	Technologies and technical means for soil cultivation	3.1	Technologies and tools for primary tillage	LK, LR
		3.2	Technologies and tools for surface tillage	LK, LR
Section 4	Technologies and technical means for sowing and planting agricultural crops	4.1	Technologies of sowing and planting agricultural crops	OK
		4.2	Types, general structure and operating principle of continuous seed drills	LR
		4.3	Types, general structure and operating principle of precision seeders	LR
		4.4	Types, general structure and operating principle of potato planting and transplanting machines	LR
Section 5	Technologies and technical means for the care of crops and plantings of agricultural crops	5.1	Basic techniques and technologies for caring for crops and plantings of agricultural crops	OK
		5.2	Types, general structure and operating principle tools for inter-row tillage of crops and plantings of row crops	LR
		5.3	Types, general structure and operating principle of machines for chemical control of weeds, diseases and pests in agricultural crops	LR
Section 6	Technologies and technical means for harvesting agricultural crops	6.1	Technologies for harvesting grain crops, corn and sunflower for grain	OK
		6.2	Types, general structure and operating principle of grain harvesters	LR
		6.3	Potato harvesting technologies	OK
		6.4	Types, general structure and operating principle of potato harvesting equipment	LR
		6.5	Technologies for harvesting open-ground vegetables	OK
		6.6	Types, general structure and operating principle equipment for harvesting open-ground vegetable crops	LR
		6.7	Feed preparation technologies	OK
		6.8	Types, general structure and operating principle of equipment for harvesting grass for hay	LR
		6.9	Types, general structure and operating principle of equipment for harvesting grass for haylage	LR
		6.10	Types, general structure and operating principle of forage harvesting equipment	LR
Section 7	Technologies and technical means for application of fertilizers	7.1	Types and technologies of application of organic and organo-mineral fertilizers	OK
		7.2	Types, general structure and operating principle of machines for applying solid and liquid organic fertilizers	LR

Section number	Name of the discipline section	Section (Topic) Contents		Type of academic work*
		7.3	Classification and technologies of application of mineral fertilizers	OK
		7.4	Types, general structure and operating principle of machines for applying mineral fertilizers	LR
Section 8	Technologies and technical means for post-harvest processing and storage harvest	8.1	Post-harvest processing and storage technologies	OK
		8.2	Types, general structure and operating principle of machines for post-harvest processing and storage of crops	LR
Section 9	Basics of operation of machine and tractor units in crop production	9.1	Technical and economic indicators of the operation of machine and tractor units	OK
		9.2	Assembly of machine and tractor units	OK

* - filled in only for FULL-TIME education: LK – lectures; LR – laboratory work; PZ – practical/seminar classes.

6. LOGISTIC AND TECHNICAL SUPPORT OF DISCIPLINE

Table 6.1. Material and technical support of the discipline

Audience type	Equipping the auditorium	Specialized educational/laboratory equipment, software and materials for mastering the discipline (if necessary)
Lecture	An auditorium for conducting lecture-type classes, equipped with a set of specialized furniture; board (screen) and technical means of multimedia presentations.	
Laboratory	An auditorium for laboratory work, individual consultations, ongoing monitoring and midterm assessment, equipped with a set of specialized furniture and equipment.	Agricultural models machines, posters, multimedia videos, digital virtual twins of agricultural machines and implements
For independent work	A classroom for independent work of students (can be used for conducting seminars and consultations), equipped with a set specialized furniture and computers with access to the electronic information system.	

* - the audience for independent work of students MUST be indicated!

7. EDUCATIONAL, METHODOLOGICAL AND INFORMATIONAL SUPPORT OF THE DISCIPLINE

Main literature:

1. Kartashevich, A.N. Tractors and cars. Design. [Electronic resource]: textbook allowance / A.N. Kartashevich, O.V. Pontalev, A.V. Gordeenko. - Electron. Dan. — Minsk: New knowledge, 2020. - 313 p. - Access mode:<http://e.lanbook.com/book/43877>
2. Polivaev O. I. Design of tractors and automobiles: Textbook / O. I. Polivaev [et al.]; under the general editorship of prof. O. I. Polivaev. – St. Petersburg: Publishing House "Lan", 2018. – 288 p.: ill. (+ insert, 8 p.). Access mode:http://e.lanbook.com/books/element.php?pl1_id=13011.
3. Mechanization and electrification of agricultural production. /A.P. Tarasenko, V.N. Solntsev, V.P. Grebnev and others. – M.: KolosS, 2006 -552 p.
4. Karabanitsky, A. P. Theoretical foundations of industrial operation of the MTP [Text] / A. P. Karabanitsky, E. A. Kochkin. - M.: KolosS, 2013. -- 95 p.: ill. - (Textbooks and teaching aids for students of higher educational institutions). - ISBN 978-5-9532-0633-4

5. Patrin, A.V. Operation of the machine and tractor fleet: a course of lectures / A.V. Patrin; Novosibirsk State Agrarian University, Engineering Institute. - Novosibirsk: IC "Golden Ear", 2014. - 118 p.: diagram., table. - Bibliography in the book; [Electronic resource]. URL:<http://biblioclub.ru/index.php?page=book&id=278185>

6. Maksimov I. I. Practical training in agricultural machinery: Textbook. - St. Petersburg: Lan Publishing House, 2021. - 416 p.: ill. Access from the Internet: http://e.lanbook.com/books/element.php?pl1_id=60045

7. Mechanization of plant growing [Text]: textbook / V. N. Solntsev [et al.]; ed. V. N. Solntseva. - Moscow: Infra-M, 2017. - 383 p.

Further reading:

1. Khalansky, V. M. Agricultural machines [Text]: textbook / V. M. Khalansky, I. V. Gorbachev. - M.: KolosS, 2004. - 624 p.

2. Tarasenko A. P. Rotary grain harvesters: Textbook. - St. Petersburg: Lan Publishing House, 2013. - 192 p.: ill. (+ insert, 8 p.). - (Textbooks for universities. Specialized literature). Access from the Internet: http://e.lanbook.com/books/element.php?pl1_id=10256

Resources of the information and telecommunications network "Internet":

1. RUDN University EBS and third-party EBSs to which university students have access based on concluded agreements

- Electronic library system of RUDN - ELS RUDN

<http://lib.rudn.ru/MegaPro/Web>

- Electronic library system "University library online"<http://www.biblioclub.ru>

- EBS Yurait<http://www.biblio-online.ru>

- Electronic Library System "Student Consultant"www.studentlibrary.ru

- Electronic library system "Troitsky Bridge"

2. Databases and search engines

- electronic fund of legal and normative-technical documentation

<http://docs.cntd.ru/>

- Yandex search engine <https://www.yandex.ru/>

- Google search engine <https://www.google.ru/>

- SCOPUS abstract database

<http://www.elsevierscience.ru/products/scopus/>

- technical expert (information and reference system of GOSTs)

<http://www.cntd.ru/>

- "Agricultural machinery" (automated reference system)

<http://www.agrobases.ru>.

Educational and methodological materials for independent work of students mastering the discipline/module:*

1. Lecture course on the subject "Mechanization of plant growing".

2. Laboratory practical training on the subject "Mechanization of plant growing".

* - all educational and methodological materials for independent work of students are posted in accordance with the current procedure on the discipline page in TUIS!

8. EVALUATION MATERIALS AND SCORE-RATING SYSTEM FOR ASSESSING THE LEVEL OF DEVELOPMENT OF COMPETENCES IN THE DISCIPLINE

Evaluation materials and point-rating system* assessments level formation of competencies (part of competencies) based on the results of mastering the discipline “Mechanization of plant growing” is presented in the Appendix to this Work Program of the discipline.

* - OM and BRS are formed on the basis of the requirements of the relevant local regulatory act of RUDN.

DEVELOPER:

Associate Professor of the
Department of Transport
Engineering and Technology

Position, BUP

Signature

Podolko P. M.

Surname I.O.

HEAD OF THE BUP:

Head of the Department of
Transport Engineering and
Technology

Position of the BUP

Signature

Asoyan A.R.

Surname I.O.

HEAD OF THE OP VO:

Professor of the Department of
Agrobiotechnology

Position, BUP

Signature

Pakina E. N.

Surname I.O.