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ERASMUS+
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Erasmus+ Project
New and Innovative Courses for Precision Agriculture (NICOPA)
Erasmus+ 597985-EPP-1-2018-1-KZ-EPPKA2-CBHE-JP

STUDY PROGRAM DESCRIPTION

Name of the program: Innovative production technology of animal products

University: S.Seifullin Kazakh Agrotechnical University

Program title:	*Innovative production technology of animal products*	**University:**	*S.Seifullin Kazakh Agrotechnical University*
Degree:	*master's degree*	**Standard period of study:**	2 years
Web link of the university:	*https://kazatu.edu.kz/*		
Web link of the program:	*https://nicopa.eu*		
Credit points (ECTS):	**8**	**Teaching language:**	*English*
Contact (email):			

Program Description:

Tasks of the discipline: mo study - innovative technologies of keeping, feeding, breeding animals; mo master - technology that will ensure good health high ability with economical use of feed; mo know - innovative technologies in animal husbandry; mo have - skills in conducting research work on innovative technologies in animal husbandry to widely use many modern methods, correctly interpret the results of research.

Objectives:

To form knowledge among master students about innovative technologies in animal husbandry and use them in practical work

Prerequisites:

For successful study of «Innovative production technology animal products» course necessary to assimilate the learning core content subjects such as Feeding animals, Breeding livestock, livestock production technology, livestock processing technology.

THE MINISTRY OF AGRICULTURE OF
THE REPUBLIC OF KAZAKHSTAN

S.SEIFULLIN KAZAKH AGROTECHNICAL UNIVERSITY

«CONFIRM»
Dean of the Faculty of «Veterenary and Animal husbandry Technology»
_____ S.K. Abdrakhmanov
«__» _____ 2019

Program
of the discipline for master students
(SILLABUS)

Discipline «Innovative production technology animal products»

Educational program «Production and processing technology of animal husbandry products», «Selection and reproduction of farm animals»

Group of educational programs «Feed, feeding of farm animals», «Selection and breeding of agricultural animals»

Speciality: 7M082 «Animal husbandry»

Syllabus complied as required by Erasmus + Project New and Innovative Courses for Precision Agriculture (NICOPA)

Nur - Sultan 2019

The discipline program of the discipline (syllabus) «Innovative production technology animal products» was compiled on the basis of the catalog of elective disciplines approved by the Academic Council of the University on August 31, 2017 for higher educational institutions in the specialty 6M080200 - " Production and processing technology of animal husbandry products ", groups of specialties - " Production and processing technology of animal husbandry products", in accordance with the working curriculum of the specialty approved by the Academic Council of the University of August 31, 2017, Protocol No. 1.

The discipline program is considered at the meeting of «Production and processing technology of animal husbandry products» Department, minutes № 11 from «21» 06. 2019

Head of Department
candidate of agricultural sciences,
assoc. prof Bostanova S.K.

The discipline program is recommended by methodical commission of «Faculty of Veterenary and Animal husbandry Technology», minutes № 10 _from "25 " 06 2019.

Chairman of the Methodological Commission
Candidate veterinarian sciences, senior teacher Eseneeva S.S.

1. INFORMATION ABOUT EDUCATOR
Issabekova Saltanat and Amantay Saltanat
Candidate of agricultural sciences (PhD), Senior Lecturer. Classes:
audience 8310; according to the approved timetable, «Production and processing technology of animal husbandry products» Tel: 29-76-14

2. INFORMATION ABOUT DISCIPLINE
Discipline name - **«**Innovative production technology animal products**»**
Is an integral component of the module - «Innovative technologies in animal husbandry»;
The number of module credits - 8 credits (240 hours);

Approximate distribution of training time

Trimester weeks	1	2	3	4	5	6	7	8	9	10	Total
1 trimester											
Lectures	2	2	2	2	2	2	2	2	2	2	20
Practical	2	2	2	2	2	2	2	2	2	2	20
SIWGE	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6	16
SIW	6,4	6,4	6,4	6,4	6,4	6,4	6,4	6,4	6,4	6,4	64
Total	12	12	12	12	12	12	12	12	12	12	120
2 trimester											
Lectures	2	2	2	2	2	2	2	2	2	2	20
Practical	2	2	2	2	2	2	2	2	2	2	20
SIWGE	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6	1,6	16
SIW	6,4	6,4	6,4	6,4	6,4	6,4	6,4	6,4	6,4	6,4	64
Total	12	12	12	12	12	12	12	12	12	12	120

3. COURSE PREREQUISITES

For successful study of **«**Innovative production technology animal products**»** course necessary to assimilate the learning core content subjects such as Feeding animals, Breeding livestock, livestock production technology, livestock processing technology.

4. COURSE POSTREQUISITES

After completing the course, the acquired knowledge is used by master students in the further study of such disciplines as Agricultural management, Agricultural marketing, Innovation in livestock production, quality and market competitiveness of livestock production.

5. COURSE DESCRIPTION

5.1 Discipline object: To form knowledge among master students about innovative technologies in animal husbandry and use them in practical work.
5.2 Tasks of the discipline:
To study - innovative technologies of keeping, feeding, breeding animals;
To master - innovative techniques in animal husbandry technology that will ensure good health

and high ability with economical use of feed;
To know - innovative technologies in animal husbandry;
To have - skills in conducting research work on innovative technologies in animal husbandry to widely use many modern methods, correctly interpret the results of research.

After studying the discipline students must:
Descriptor A - know and understand

- ensure the rational maintenance, feeding and breeding of all types of animals;
- plan the selection and breeding work of the herd, production;;
- ensure the reproduction of the herd, the rearing of young animals;
- make the selection of progressive, cost-effective livestock production technologies;
- plan the production of livestock products, evaluate the quantity and quality of products
- collect, process, analyze and synthesize scientific and technical information, advanced domestic and foreign experience in the field of animal science;
- make reports (sections of the report) on the topic or its section (stage, task);
- participate in the implementation of research and development results;
- advise on issues of breeding, feeding, keeping animals and livestock production technology;
- to know about the experience of state and commercial combined or individual structures and services on issues of innovative animal feeding technologies and feed technologies;
- plan the organization and application of innovative technologies for animal feeding, depending on the chemical composition and properties of feed and additives;
- apply new trends in the field of improvement (modernization) of innovative animal feeding technologies and feed technologies.

Be able to (Descriptor B):

- apply modern methods of feeding, breeding, stock breeding in scientific work.

the ability to determine the effectiveness of growing farm animals at the enterprise;
Possess (Descriptor C, D, E):
the ability to determine the effectiveness of growing farm animals at the enterprise;
the ability to provide rational maintenance, feeding and breeding of all types of animals in the conditions of innovative technology.
Acquire practical skills (Descriptor C, D, E):
To acquire practical skills in the basics of breeding and daily ration, assessing the productivity of farm animals.

6. COURSE CONTENT

6.1 List of lecture classes

№	Title and theme summary	Amount, hours	Week	Literature
1 trimester				
1	**The value of innovative technologies in animal husbandry.** Innovative technologies in dairy cattle breeding. Types of innovative technologies, their application. Application of innovative technologies in beef cattle breeding. Scientific basis for the formation of highly productive animals.	2	1	1-6
2	**Improving innovative technologies in the production of milk.** Technological modernization of dairy farms. The optimal size of dairy farms.	4	2-3	1-6

	Features of feeding and keeping cows and young animals in beef cattle breeding. Organization and conduct of a random company and cattle breeding. Various technologies of intensive beef cattle breeding. Cow-calf technology in specialized beef cattle breeding. Implementation of a fatted livestock. Growing and fattening livestock in farms of various forms of ownership.			
3	**The use of innovative technologies in various sectors of livestock.** The principle of manning farms involved in the cultivation of replacements. Organization of rearing young stock. Age and live weight of heifers at the first fertilization. Justification of the rate of replace of the herd. Features of the technology of growing young stock in farms with different concentrations of livestock. The concept of growing, completion growing and fattening animals. Features of fattening of adult animals.	2	4	1-6
4	**The use of new technologies in various systems and methods of keeping animals.** Systems and methods for keeping dairy cows in winter and summer. Preparation and distribution of them, the use of natural and artificial pastures and crops of the green conveyor. Organization of water supply. Cleaning, storage and disposal of manure. Methods and techniques of milking. Definition of feed requirements.	2	5	1-6
5	**The use of innovative technologies in various methods of growing young farm animals.** Methods of growing young stockin various sectors of livestock. The value of the colostrum for young farm animals. Planning for rearing young stock. The use of pasture when growing young animals.	2	6	1-6
6	**Features of the reproduction of farm animals using innovative technologies.** The principles of the formation of groups of animals with tethered and loose housing. The structure of the herd and its justification in farms of various specializations. Key indicators of herd reproduction. Assessment of the reproductive ability of bulls.	2	7	1-6
7	**Innovative technologies for the production of lamb and wool.** Biological aspects of growing young sheep. Feeding and keeping sheep of different age and gender groups. Breeds of sheep. Innovative technologies in sheep farming.	2	8	1-6
8	**Innovative technologies for the production of horse meat and koumiss.** Biological aspects of rearing young horses. Feeding and keeping horses. Breeds of horses. Innovative technologies in productive horse breeding.	2	9	1-6
9	**Innovative technologies for the production of eggs and poultry meat.** Biological aspects of growing young stock of various species of poultry. Feeding and keeping birds. Classification of breeds of birds. Innovative technologies in poultry farming	2	10	1-6
2 trimestr				
1	Condition and Prospects of Precision agriculture	2	1	1-6
2	The development of smart agriculture and livestock	2	2	1-6

3	The economic effect of the introduction of digital technologies in livestock	2	3	1-6
4	Observation of the animal and its location	2	4	1-6
5	Electronic identification of animals	2	5	1-6
6	Computerization of processes in precision animal husbandry	2	6	1-6
7	Electronic database of the production process	2	7	1-6
8	Programming and automatic assignment of animal care.	2	8	1-6
9	Collection and removal of statistics for all monitored indicators;	2	9	1-6
10	Feed, water, their dosage	2	10	1-6

6.2 List of practical classes

Module	Title and theme summary	Tasks, purpose and content	Amount, hours	Literature	Week	Current control, %
1 trimestr						
Innovative technologies in animal husbandry	Innovative technologies in cattle breeding	The value of resource-saving technologies. Features of the development of dairy and beef cattle breeding in foreign countries. Intensification of cattle breeding abroad.	2	1-6	1	50/100
	The importance of interior and exterior when applying innovative technologies in cattle breeding.	The concept of interior and exterior. The effect of interior and exterior on productivity. Types of higher nervous activity and their significance in livestock ethology.	2	1-6	2	50/100
	Innovative technologies in dairy cattle breeding	Technological basis of milk productivity. Factors affecting milk yield and milk composition: breed, age, stage of lactation, live weight, age and live weight at the first hotel, duration of the dry period and service period, food, milking rate, milking technique, etc. Indicators of milk productivity. Lactation and lactational curve. Individual and statistical accounting of milk productivity, planning of milk productivity.	2	1-6	3	50/100
	The technology of growing young stock using innovative technologies	The value of the colostrum for calves. Methods of growing calves and young animals in dairy and beef cattle breeding. Planning for rearing young stock. Age and live weight of heifers at the first fertilization. Technologies use of pastures while growing young stock.	2	1-6	4	50/100
	Systems and methods for keeping cattle with resource-saving technologies	Systems and methods for keeping dairy cows in winter and summer. Determination of feed requirements. Preparation and distribution of them, the use of natural and artificial pastures and crops of the green conveyor. Methods and techniques of milking. Schedule.	2	1-6	5	50/100
	Innovative technologies for milk production and	Technology for the formation of animal groups with tethered and loose housing. The structure of the herd and its justification	2	1-6	6	50/100

herd reproduction.	in farms of various specializations. Innovative technologies for milk production in farms with different ownership forms.				
Modern meat production technologies in farms of various ownership forms	Features of feeding and keeping cows and young stock in beef cattle breeding. Various technologies of intensive beef cattle breeding. Cow-calf technology in specialized beef cattle breeding. Implementation of a fat livestock. Growing and fattening livestock in farms of various forms of ownership.	2	1-6	7	50/100
Innovative technologies for the production of lamb and sheep wool.	Rational use of pastures in sheep breeding, methods of fattening and feeding. Productivity Level Planning.	2	1-6	8	50/100
Innovative technologies for the production of horse meat and koumiss	Innovative technologies of keeping and feeding are applied in horse breeding abroad. Productive horse breeding Kazakhstan, ways to increase horse productivity.	2	1-6	9	50/100
Technologies for improving the quality of livestock and poultry products	Innovative methods of keeping birds. Rational feeding of poultry and feed additives. Productivity Level Planning.	2	1-6	10	50/100
2 trimestr					
Precision dairy farming	Automated calf feeders robotization of the milking process	2	1-6	1	50/100
	Smart technologies for dairy cattle	2	1-6	2	50/100
	Robotization of the milking process	2	1-6	3	50/100
Identification and monitoring of individuals, meeting their individual needs	Identification, registration and registration of farm animals Identification and monitoring of cattle	2	1-6	4	50/100
Monitoring the health state of the herd	Monitoring the health state of the cattle. Monitoring the health state of the sheep. Monitoring the health state of the poultry	2	1-6	5	50/100
Monitoring the quality of livestock products	Monitoring the quality of dairy products	2	1-6	6	50/100
	Monitoring the quality of meat products	2	1-6	7	50/100
	Monitoring the quality of poultry products	2	1-6	8	50/100
Precision poultry farming	Eggs, aimed at improving the quality indicators of products;	2	1-6	9	50/100
	Control of lighting, ventilation and temperature of the farm;	2	1-6	10	50/100

6.3 The criterion for assessing the knowledge of students in practical classes

Based on letter system	The digital equivalent of points	% content	Traditional system assessment	Student knowledge assessment criterion
A	4,0	95-100	Excellent	**The student demonstrates excellent knowledge in the topics of practical classes:** - Innovative technologies in cattle breeding - The importance of interior and exterior when applying innovative technologies in cattle breeding - Innovative technologies in dairy cattle breeding - The technology of rearing young animals using innovative technologies - Systems and methods for keeping cattle with resource-saving technologies - Innovative technologies for milk production and herd reproduction. - Modern meat production technologies in farms of various forms of ownership - Technologies for improving the quality of livestock and poultry products - Innovative technologies for the production of lamb and sheep wool - Innovative technologies for the production of horse meat and koumiss
A-	3,67	90-94		**The student demonstrates excellent knowledge in the topics of practical classes:** - Innovative technologies in cattle breeding - The importance of interior and exterior when applying innovative technologies in cattle breeding - Innovative technologies in dairy cattle breeding - The technology of rearing young animals using innovative technologies - Systems and methods for keeping cattle with resource-saving technologies - Innovative technologies for milk production and herd reproduction. - Modern meat production technologies in farms of various forms of ownership - Technologies for improving the quality of livestock and poultry products - Innovative technologies for the production of mutton - Innovative horse meat production technology

B+	3,33	85-89	Good	**The student demonstrates high knowledge in the topics of practical classes:** - Innovative technologies in cattle breeding - The importance of interior and exterior when applying innovative technologies in cattle breeding - Innovative technologies in dairy cattle breeding - The technology of rearing young animals using innovative technologies - Systems and methods for keeping cattle with resource-saving technologies - Innovative technologies for milk production and herd reproduction. - Modern production technologies - Technologies for improving the quality of livestock and poultry products - Innovative technologies for the production of mutton - Innovative horse meat production technology
B	3,0	80-84		**The student demonstrates high knowledge in the topics of practical classes:** - Innovative technologies in cattle breeding - Innovative technologies in dairy cattle breeding - Technology for growing young animals - Systems and methods for keeping cattle with resource-saving technologies - Innovative technologies for milk production and herd reproduction. - Modern production technologies - Technologies for improving the quality of livestock and poultry products - Innovative technologies for the production of mutton - Innovative horse meat production technology
B-	2,67	75-79		**The student demonstrates high knowledge in the topics of practical classes:** - Innovative technologies in cattle breeding - Innovative technologies in dairy cattle breeding - Technology for growing young animals - Systems and methods for keeping cattle with resource-saving technologies - Modern production technologies - Technologies for improving the quality of livestock and poultry products - Innovative technologies for the production of mutton

				-Innovative horse meat production technology
C+	2,33	70-74	Satisfactorily	**The student demonstrates satisfactory knowledge in the topics of practical classes:** - Innovative technologies in cattle breeding - Innovative technologies in dairy cattle breeding - Technology for growing young animals - Systems and methods for keeping cattle with resource-saving technologies - Modern production technologies - Technologies for improving the quality of livestock and poultry products - Innovative technologies for the production of mutton - Innovative horse meat production technology
C	2,0	65-69		**The student demonstrates satisfactory knowledge in the topics of practical classes:** - Innovative technologies in cattle - Innovative technologies in dairy cattle - Technology for growing young animals - Modern production technologies - Technologies for improving the quality of livestock and poultry products - Innovative technologies for the production of mutton - - Innovative horse meat production technology
C-	1,67	60-64		- **The student demonstrates satisfactory knowledge in the topics of practical classes:** - Innovative technologies in cattle breeding - Innovative technologies in dairy cattle breeding - Technology for growing young animals - Modern production technologies - Technologies for improving the quality of livestock and poultry products - Innovative technologies for the production of mutton
Д+	1,33	55-59		- **The student demonstrates satisfactory knowledge in the topics of practical classes:** - Innovative technologies in cattle breeding - Innovative technologies in dairy cattle breeding - Technology for growing young animals - Modern production technologies

				- Technologies for improving the quality of livestock and poultry products
Д	1,0	50-54		**The student demonstrates satisfactory knowledge in the topics of practical classes:** - - Innovative technologies in cattle breeding - - Innovative technologies in dairy cattle breeding - - Technology for growing young animals - - Modern production technologies
F	0	0-49	unsatisfactory	**The student demonstrates:** - not knowledge of program material, - gross mistakes are made when performing all types of tasks; - lack of skills in the application of individual techniques for completing tasks; - non-fulfillment of certain types of tasks stipulated by the forms of current, intermediate and final control.

6.4. DISCIPLINE SCHEDULE OF TASKS IMPLEMENTATION AND PASSING (SIW)

№	Module	Classes theme	Tasks, purpose and content	Recom-mended litera-ture	Control form	Dead-line	Mark assess-ment
1 trimestr							
1	innovativetechnologiesinanimalhusbandry	Innovative technologies in dairy cattle breeding	Resource-saving technologies used in the industry. Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young stock, new trends in breeding in the industry.	Internet resources	Presentation	2	50/100
2		Innovative technologies in beef cattle breeding	Resource-saving technologies used in the industry. Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young stock, new trends in breeding in the industry.	Internet resources	Presentation	3	50/100
3		Innovative	Resource-saving technologies used in the industry. Features of	Internet	Presentati	4	50/100

		technologies in poultry farming	feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young stock, new trends in breeding in the industry.	resources	on		
4		Innovative technologies in horse breeding	Resource-saving technologies used in the industry. Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young stock, new trends in breeding in the industry.	Internet resources	Presentation	5	50/100
5		Innovative technologies in sheep farming	Resource-saving technologies used in the industry. Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young stock, new trends in breeding in the industry.	Internet resources	Presentation	6	50/100
6		Innovative feeding technology	Innovative technologies in feeding in different species of animals.	Internet resources	Presentation	7	50/100
7		Innovative technologies in reproduction	Innovative technologies to increase reproductive ability in different species of animals.	Internet resources	Presentation	8	50/100
8		Creating an innovative model farm	The project plan for creating a model farm that meets modern requirements for the production of milk and meat products.	Internet resources	Situational game in groups	9	50/100
2 trimestr							
1		Precision Livestock Farming technologies	The economic effect of the implementation of the RFID system in animal husbandry	Internet resources	Presentation	2-3	50/100
2		Animal production	Precision Livestock Farming Use of technologies to optimize animal production	Internet resources	Presentation	4-5	50/100
3		Animal welfare	Precision livestock farming technologies for welfare management in intensive livestock systems	Internet resources	Presentation	6-7	50/100
4		Precision Livestock Farming in KZ	A strategic research and innovation agenda for a sustainable livestock sector in KZ	Internet resources	Presentation	8	50/100

5		Precision dairy farming	The importance of using smart technologies for dairy cattle	Internet resources	Presentation	9	50/100
6		Identification and Monitoring of farm animals	Future trends in the use of innovation technologies for animal health management and monitoring	Internet resources	Presentation	10	50/100

6.5 Criterion for assessing the knowledge of students in (SIW)

Based on letter system	The digital equivalent of points	% content	Traditional system assessment	Student knowledge assessment criterion
A	4,0	95-100	excellent	- **The student demonstrates excellent knowledge in SIW topics:** - Resource-saving technologies used in the industry. Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Resource-saving technologies used in the industry. Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Resource-saving technologies used in the industry. Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Resource-saving technologies used in the industry. Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Resource-saving technologies used in the industry. Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative technologies in feeding in different species of animals. - Innovative technologies in increasing reproductive ability in different species of animals.

A-	3,67	90-94		**- The student demonstrates excellent knowledge in SIW topics:** - Resource-saving technologies used in the industry. Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Resource-saving technologies used in the industry. Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative technologies in feeding in different species of animals. - Innovative technologies in increasing reproductive ability in different species of animals.
B+	3,33	85-89	good	**- The student demonstrates high knowledge in SIW topics:** - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry.

				- Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative technologies in feeding in different species of animals. Innovative technologies to increase reproductive ability in different species of animals.
B	3,0	80-84		- **The student demonstrates high knowledge in SIW topics:** - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative technologies in feeding in different species of animals.
B-	2,67	75-79		- **The student demonstrates high knowledge in SIW topics:** - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new

				trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry.
C+	2,33	70-74	satisfactorily	- **The student demonstrates satisfactory knowledge in SIW topics:** - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry.
C	2,0	65-69		**The student demonstrates satisfactory knowledge in SIW topics**: - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry.

				- Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry.
C-	1,67	60-64		- **The student demonstrates satisfactory knowledge in SIW topics:** - Features of feeding and keeping in the innovative technology of the industry. Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry.
Д+	1,33	55-59		- **The student demonstrates satisfactory knowledge in SIW topics:** - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry.
Д	1,0	50-54		- **The student demonstrates satisfactory knowledge in SIW topics:** - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry. - Innovative ways to increase productivity in the industry, rearing young animals, new trends in breeding in the industry.

F	0	0-49	unsatisfactory	**Student demonstrates**: - not knowledge of program material, - gross mistakes are made when performing all types of tasks; - lack of skills in the application of individual techniques for completing tasks; - non-fulfillment of certain types of tasks stipulated by the forms of current, intermediate and final control.

7. MAIN FORMS AND METHODS OF TRAINING

Forms of teaching: lectures, laboratory and practical work, independent work of students, independent work of the student and teacher

Methods of teaching: lecture, illustrations, performance of laboratory and practical works, independent work with directories and literature (regular and electronic), independent written exercises, independent work at the computer, individual interview, computer testing, control work; control laboratory and practical work; work with monitoring programs.

8. LIST OF LITERATURE

8.1. Basic:

1. Alipbeki O.A. Precision Agriculture/ Astana- 2018
2. Kuznecov A.F., Mihajlov N.A., Karcev P.S. Modern production technologies for keeping farm animals. -Krasnodar, 2013, -445 p. (Rus)
3. Lyashchenko V.V., Delyan A.S. Livestock. -Krasnodar, 2014, -635p. (Rus)
3 Nechaev V.I., Artemova E.I. Problems of innovative development of livestock.. – Krasnodar, 2009. – 159 p. (Rus)

8.2. Additional:

4. Torekhanov A.A. Modern aspects in cattle breeding / Astana 2012, 204 p. (Rus)
5. Satygul S.SH. Large-scale selection in cattle breeding / Astana 2008, 116 p. (Rus)

9. Course politics

- not be late for lectures and practical classes;
- not miss classes without valid reasons;
- work out missed classes at the educator appointed time;
- maintain discipline during classes;
- do and pass independent work tasks in a timely manner;
- keep polite relations with teachers and fellow students.

For failure to comply these provisions students total mark can be downgraded.

10. Information on knowledge assessment

Assessing the level of students knowledge is carried by the following control types:

The current control - attending lectures and note-taking, visiting practical classes and tasks implementation; implementation and passing tasks of students independent work.

Final control - passing of computer-test examination.

11. Grading Politics

Based on a 100 (100%) point system and provides for the following distribution of points. The total score for the discipline in percentage is determined by the formula: And% = TKsr * 0.6 + E * 0.4Knowledge assessment scheme by the discipline

	Classes and student works types	Points min/max
I	**Current control:** Tasks completed during the trimester (laboratory and practical classes, independent work of the student).	50 / 100
	Total (amount):	50 / 100
III	**Final control** **Examination**	50 / 100
	Total (amount):	50 / 100

Scheme of students knowledge assessment at examination

	Exam mark	Assessment in points
1.	**Current control:**	50 / 100
2.	**Final control**	50 / 100
	Total (amount):	50 - 100

Scale of students knowledge assessment

Literal assessment	Digital equivalent	% of mastering of educational discipline content	Traditional system
A	4,0	95-100	Excellent
A-	3,67	90-94	
B+	3,33	85-89	Good
B	3,0	80-84	
B-	2,67	75-79	
C+	2,33	70-74	Satisfactorily
C	2,0	65-69	
C-	1,67	60-64	
D+	1,33	55-59	
D	1,0	50-54	
F	0	0-49	Unsatisfactorily

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