Ministry of Agriculture of the Republic of Kazakhstan
S.Seifullin Kazakh Agrotechnical University

Reviewed
at the meeting of the
University Academic Council
Protocol number ___
dated 30 05 2019

APPROVED BY
Chairman of the Board JSC
"S.Seifullin Kazakh Agro
Technical University"
_____ A.K. Kurishbayev
"30" 05 2019

EDUCATIONAL PROGRAM
"Veterinary welfare of animals"
(name of the program)

Area Code and Classification: 8D09 Veterinary Medicine
Code and classification of training areas: 8D091 - "Veterinary Medicine"
Code in the International Standard Classification of Education: 8D 0841
Qualification: Doctor of Philosophy (PhD) in the educational program "Veterinary welfare of animals"
Training term: 3 years, scientific and pedagogical
Form of study: full-time

Nur-Sultan, **2019**

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The authors approved by the order of JSC "S.Seifullin KazATU"
№ 932-H from 12.12.2018; № 962-H from 28.12.2018; № 964-H from 28.12.2018
Educational program "Veterinary welfare of animals"
reviewed in meeting of Veterinary Medicine Department
Protocol No.9, 14 March 2019,
approved by the Faculty Council
Protocol No.9, 2 May 2019.

Dean of the Veterinary and Animal
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Content

1 Passport of the educational program (EP)
1.1 Goals and objectives of the modular educational program

The purpose of the program is to train highly specialized personnel for management, research and teaching activities aimed at ensuring the welfare and protection of animal and human health in the field of veterinary medicine, agriculture and biology.

The content of the EP provides the acquisition of knowledge and practical skills for the implementation of conceptual studies to justify measures to control animal diseases in the conditions of the Customs Union and the World Trade Organization, as well as in accordance with the requirements and recommendations of international organizations (World Organization for Animal Health, Food and Agriculture Organization, United Nations World Health Organization).

The main objectives of the EP in the specialty 8D09 - "Veterinary" are to:

- deepening of theoretical and practical knowledge on the veterinary fields, due to the needs of the state and the agricultural market, the activities of scientific and educational institutions;
- training of specialists with a high level of professional culture and civic position, able to formulate and solve modern scientific and practical problems in the structures of veterinary medicine, education and business;
- formation of doctoral candidates skills and abilities that promote integration into the global scientific and educational community;
- to provide an individual educational trajectory of study in accordance with the specialization chosen by the doctoral student.

The EP was compiled taking into account the current staffing needs of potential employers from the education and agricultural sector, knowledge-intensive enterprises, specialized laboratories, as well as research institutions of agricultural and biological profiles.

2 General characteristics of the educational program (relevance, features, competitive advantages, uniqueness, stakeholders, etc.)

The EP in the specialty 8D09 - "Veterinary" was developed in accordance with the National Qualifications Framework and professional standards, consistent with the Dublin descriptors and the European Qualifications Framework, based on the State Compulsory Higher Education Standard, approved by order of the Minister of Education and Science dated October 31, 2018 (№604) and the standard curriculum specialty 8D09 - "Veterinary". EP is designed on the basis of a modular system for the study of disciplines and contains 5 modules that form general cultural, special language and professional competencies.

The number of credits is 180 credits, of which: theoretical training - 53 credits, for practical training (all types of practices) - 115 credits, final attestation - 12 credits.

The relevance of the EP corresponds to the main directions of international research in specific branches of the veterinary sciences; they form the skills and abilities of doctoral students in conducting modern scientific work and integration into the world scientific community.

The peculiarity of the EP is that it provides the labor market demand for scientific and practical personnel of the veterinary profile who have special competencies in the field of epidemiology, modeling and molecular biological research of infectious diseases, biotechnology for reproduction of populations of farm animals, food safety management of animal products in conditions of globalization of the world economy.

The competitive advantages of the study program are that it aims to conduct comprehensive research by doctoral students and implement interdisciplinary research projects that solve specific significant regional problems of Kazakhstan in the field of agriculture, health care and veterinary medicine.

The uniqueness of the program lies in the fact that the process of its implementation is carried out in the framework of international, republican and grant research projects, as well as direct contracts with business entities that allow doctoral students to use the material and technical platforms and resources of the university, other scientific institutions and enterprises when conducting research. to achieve innovative results that meet international standards.

The EP stakeholders are official veterinary services, laboratories of regional, regional and republican significance of Kazakhstan, NPP Atameken, agro-industrial enterprises, leading research institutes of Kazakhstan of a veterinary and biological profile.

3 Competency model (portrait) of the graduate

3.1 Professional activities

- implementation of research activities in scientific and design organizations of veterinary, biological and agricultural areas;
- pedagogical activity in organizations of secondary, higher, and additional professional agricultural, technological, and biological education;
- participation in the management of the state, interstate veterinary service, as well as the control and supervision of dangerous infectious and non-contagious animal diseases;
- organization of production, research and business structures.

3.2 Types of professional activity

Doctors of philosophy (PhD) 8D09 - "Veterinary" can perform the following professional activities:
- production and management;
- organizational and technological;
- research;
- project;
- pedagogical.Specific activities are determined by the content of the educational program.

3.3 General Education Competences

OP Doctor of Philosophy (PhD) specialty 8D09 - "Veterinary"
- an idea of the evolution, the basic concepts of world and domestic achievements of veterinary, agricultural and biological sciences and practice;
- compliance with the principles of scientific ethics;
- knowledge of international and domestic veterinary legislation and regulatory documents; methodologies of scientific knowledge;

3.4 Basic Competences

The following basic values are defined:
- conducting a professional and comprehensive analysis of problems in the relevant field;
- the ability of interpersonal communication and human resource management, university training specialists;
- have patent search skills; protection of intellectual property rights; analysis of scientific theories and ideas;
- have public speaking and experience in public speaking at scientific forums
- possession of knowledge in the field of economic policy of the state, management of enterprises and economic entities of agricultural profile.
- the use of a foreign language for scientific communication and international cooperation.

3.5 Professional Competences

- organization of scientific and educational activities in the context of globalization, rapid updating and growth of information flows;
- implementation of management of theoretical, experimental and applied research;
- possession of scientific methodology, modern software products for processing results;
- competent examination of scientific projects and research;
- possession of pedagogical methodologies of higher and specialized secondary education;
- ensuring continuous professional growth.

4 Base of professional practice

Doctor of Philosophy (PhD) of the specialty 8D09 - "Veterinary" can undergo professional practice in the following institutions:

- In institutions of the state veterinary service, in veterinary posts at the border and transport, at checkpoints;
- at the enterprises for the manufacture and control of biological preparations and biologically active substances;
- in research institutes, in public and private veterinary organizations;
- enterprises, organizations leading the training and retraining of veterinary specialists;
- research and development, design organizations in the field of veterinary medicine.

5 Structure of the educational program of doctoral studies in the scientific and pedagogical direction

№ п/п	The name of the cycles of disciplines and activities	Total labor intensity	
		in academic hours	in academic credits
1	2	3	4
1.	**Educational component**	1590	53
1.1	The cycle of basic disciplines (BD)		
1)	University component		
	Biotechnological methods of animal reproduction	180	6
	Veterinary Immunology	150	5
	Especially dangerous infectious of animal diseases	150	5
2)	Elective component		
1.2	The cycle of the special disciplines (SD)		
	Diagnosis and treatment reproductive of organs diseases Veterinary and technological methods to improve the reproductive function of animals	180	6
	Modeling epidemiological processes in parasitic diseases Mathematical epidemiology	150	5
3)	Research practice	630	21
	Teaching practice	150	5
2	**Research work**	3450	115
1)	Doctoral student's research work, including internship and doctoral dissertation		
3	**Additional types of training**		
4	**Final examination**	360	12
1)	Writing and defending a doctoral dissertation	360	12
	Total	5400	180

Appendix 1. Academic calendar for the 2019-2022 academic year for the specialties of doctoral studies at the Faculty of Veterinary Medicine

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Курс		September				October				November				December					January				February				March					April				May				June					July				August					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
	1	2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27	3	10	17	24	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31
		6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	31	7	14	21	28	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	
irection of preparation of doctoral studies 8D09 "Veterinary welfare of animals"																																																							
I		ПН	.	.	.	.	.	.	.	.	.	.	С	С	ЗД	ЗС	К	К	К	Н	Н	Н	Н	Н	Н	.	.	.	.	С	С	К	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	С	С	Л	Л	Л	Л	Л	Л	К	К	К	
II		ПН	П	П	П	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	К	К	К	ИП	ИП	ИП	ИП	ИП	ИП	ИП	ИП	ИП	ИП	ИП	ИП	К	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Л	Л	Л	Л	Л	Л	К	К	К	
III		ПН	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	К	К	К	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	Н	С	С	К	Н	Н	Н	ИА	ИА	ИА	ИА	ИА	ИА	ИА	Л	Л	Л	Л	Л	Л	Л	Л	К	К	К	

Pw -- presentation week

● -- theoretical training

bc - boundary control

es - examination session

s summer semester

rp - research practice

tp - teaching practice

R research practice

rg record in the disciplines

d - c, delivery

V - vacation

Fc final certification

Праздничные дни:

August 11 - Constitution Day

August 21 - Kurban Ait

December 1 - Day of the First President

December 16, 17 - Independence Day

January 1, 2 - New Year

8 march international women day

21, 22, 2.23march Nauryz holiday

May 1 - The holiday of unity of the people of Kazakhstan

May 7 - Defender of the Fatherland Day

May 9 - Victory Day

July 6 - Capital Day

Total weeks:

theoretical training - 30 weeks

exam session - 4 weeks

winter vacation -4-5 weeks

summer vacation - 6-9 weeks

summer semester - 6 weeks

Appendix 2. Working curriculum

Cy-cle of dis-cip-lines	Code of subject	Subject name	RK credits	ECTS credits	Control by semesters			Volume of hours							Distribution of study hours by semester/terms/quarters								
					Exams	Differentiated test (practice)	Differentiated test(course paper)	Total	In-class learning	including			Self-study work of PhD student with teacher	Self-study work of PhD student	1	2	3	4	5	6	7	8	9
										Lectures	Practice	Lab practicals			1 course			2 course			3 course		
															Number of weeks in the semester/term/quarter								
															10	10	10	10	10	10	10	10	10
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
BS	**Basic subjects, total**																						
UC	**University component**		**11**	**11**				**330**															
Module 1 - Animal Reproduction Biotechnology - 6 credits																							
	BMAR 8201	**Biotechnological methods of animal reproduction**	6	6	1			180	54	24	30	-	66	60	6								
	PP	**Pedagogical practice**	5	5				150									5						
Module 2- Immunology- 5 credits																							
	VI 8202	**Veterinary Immunology**	5	5	1			150	45	15	30	-	55	50	5								
PD	Profile disciplines																						
UC	**University component**		**16**	**16**				**480**															
Module 3 - Highly Dangerous Infectious Diseases - 5 credits																							
	HDID 8203	**Highly Dangerous Infectious Diseases**	5	5	1			150	45	15	30	-	55	50		5							
КВ	**Компонент по выбору**																						
Module 4 - Diseases of the reproductive organs - 6 credits																							
КВ	DTDRO 8204	**Diagnosis and treatment of diseases of the reproductive organs**	6	6	1			180	54	24	30	30	66	60		6							
Модуль 5- Parasitic diseases - 6 credits																							

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
KB	MEPPD 8205	**Modeling the epidemiological processes in parasitic diseases**	5	5	1			150	45	15	30	-	55	50			5						
	RP	Research practice	21	21	1			630										8	7	7			
TOTAL theoretical training				**53**		**53**																	
PhDSRW		**PhD student's experimental work, incl. doctoral thesis**			115				3450									1	17	18	18	**25**	**25**
FA		**Final attestation**	**12**	**12**	**12**				**360**														
PhDDD		**PhD dissertation defence**	12	12	12				360														
		Total	**180**	**180**	**180**				**5400**							**11**	**11**	**11**	**25**	**25**	25	**25**	**25**

Appendix 3. Description of compulsory and university component disciplines

1. Basic information about the discipline:	
Name of the discipline	Biotechnological methods of animal reproduction
2. Number of credits	6
3. Pre requisites:	Methods of research in obstetrics, the basics of reproduction biotechnology
4. Post requisites:	Formation of professional skills of a teacher and a scientific researcher with development of scientific work methods
5. Competences:	By the end of the course, the doctoral student should to know fundamentals of modern theory of animals' reproduction, to master technologies for genetic engineering manipulations with ova and embryos, to apply the acquired knowledge in practical activities.
6. Course author	Veterinary Medicine Department
7. The main literature	1. Глик Б., Пастернак Дж. Молекулярная биотехнология. Принципы и применение. М. Мир, 2002. 589 с. 2. Корочкин Л.И. Биология индивидуального развития (Генетический аспект) М. МГУ, 2002, 264 с. 3.Шевелуха В.С., Калашникова Е.А., Воронин Е.С. и др. Сельскохозяйственная биотехнология. 2-е изд. М. Высшая школа, 2003. 4. Щелкунов С.Н. Генная инженерия. Новосибирск. Изд-во Новосибирского государственного университета. 2004. 5. Абдрахманов Т.Ж. Биотехнологические методы размножения животных. (методические указания). Астана, 2016. 35 с.
8. The content of the discipline: Questions of general and cellular biotechnology in animal husbandry are being studied; methods of molecular biotechnology for animal breeding are being investigated; The principles of embryoengineering, embryo culture, embryotransplantation, the production of transgenic mice, the methods of transgenesis, cloning, and the production of chimeric animals are considered; the skills of creating a cryobank of gametes and embryos are formed; the vital method of studying reproductive cells of animals is being mastered.	

1. The main information about the discipline:	
Name of the discipline	**Veterinary Immunology**
2. Amount of credits	5
3. Prerequisites:	Morphology, Physiology, Histology, Genetics, Biochemistry, Veterinary Microbiology and Immunology, Veterinary Virology, Especially dangerous infectious animal diseases.
4. Postrequisites:	Biotechnological methods of animal reproduction, Modeling epidemiological processes in parasitic diseases, Diagnosis and treatment of diseases of the reproductive organs.
5. Competences:	By the end of the course, the doctoral student should be able to choose the right approach to the prevention and diagnosis of a wide range of infectious and invasive diseases of farm animals; apply the acquired knowledge in their future practical activities.
6. Course author	Verterinary Medicine Department
7. Main literature	1. Mohanty S.K. Textbook of Immunology.- Jaypee Brothers Medical Publishers (P) Ltd.- Second Edition: 2014.- 259 P. 2. MacPherson G.G. and Austyn J.M. Exploring Immunology.- Wiley-VCH, Verlag&Co.KGaA.-2012.-351 p . 3.Khaitov R.M. Immunology: textbook.-Moscow:GEOTAR-Media, 2008.-256 p. 4.Fundamental immunology. edited by William E. Paul. —6th ed. // 2008 by Lippincott Williams & Wilkins, -.1646 p. 5.Day J.M.and Schultz D.D. Veterinary Immunology.- NJ: CRSPress, 2014.-317 p. 6. Bulashev A.K., Serikova Sh. General Immunology (Practicum).- Publishing house of Seifullin KazATU: Astana, 2016.-38 P. 7. Bulashev A.K., Serikova Sh. «Educational-methodical complex (EMC) on discipline" General Immunology" for Doctoral students on Speciality 6D120100 - "Veterinary Medicine".- Publishing house of Seifullin KazATU: Astana, 2016.-38 P.42.

8. The content of the discipline.

The content of the discipline includes the functioning of the immune system in the normal and in immunopathological conditions; the role of the immune system in maintaining homeostasis of the body, to uncover the mechanism of immunological recognition of antigens and the regulation of the immunological response at the molecular and cellular level; knowledge about the immunological mechanisms underlying the pathogenesis of autoimmune pathology, graft rejection, tumor growth, development of hypersensitivity; modern methods for laboratory evaluation of the immune status of animals; principles and methods of vaccine prophylaxis, classification of modern vaccines.

1. The main information about the discipline:	
Name of the discipline	**Highly Dangerous Infectious Diseases**
2. Amount of credits	5
3. Prerequisites:	Research methods in Microbiology, Virology, Epizootology and Basics of Veterinary Sanitation
4. Postrequisites:	Formation of professional qualities of a teacher and a scientific researcher with mastering the scientific methods when it comes to highly dangerous infectious diseases.
5. Competences:	To be competent in carrying out anti-epizootic measures against highly dangerous infectious diseases. To be good at scientific methodology, modern software products, processing of results; to use that knowledge in their professional activities
6. Course author	Verterinary Medicine Department
7. Main literature	1. Highly Dangerous Infectious Diseases of Animals and Birds [Osobo opasnyie infektsionnyie bolezni zhivotnyih i ptits]. Piontkovsky V.I., Mustafin M.K. Textbook, 2006.-p.243. 2. Infectious Animal Diseases [Infektsionnyie bolezni zhivotnyh]. Edited by Professor Sidorchuk A.A., M., Kolos S, 2007. 3. Diagnosis of Infectious Animal Diseases [Diagnostika infektsionnyh bolezney zhivotnyh]. Ivanov N.P. Textbook, Almaty, 2009.-p.350. 4. Epizootology with Veterinary Sanitation [Epizootologiya s veterinarnoy sanitariey]. Abdrakhmanov S.K., Maikanov B.S., Yakubovsky T., etc. Textbook, 2015.-p.540. 5. Organization of Veterinary Affairs [Organizatsiya veterinarnogo dela]. Abdrakhmanov S. K. Laboratory manual, Astana, 2006 6. Baikadamova G.A. Rare and Exotic Diseases of Animals and Birds [Redkie i ekzoticheskie bolezni zhivotnyih i ptits]. Almaty, Nur-Print. 2011.-p.266.

The content of the discipline

The epizootic situation of especially dangerous infectious diseases in the world and the Republic of Kazakhstan is considered. Modern methods of prevention and control of FMD, contagious pleuropneumonia, nodular dermatitis, rinderpest of cattle; bluetongue, smallpox, sheep, and Peste des Petits Ruminants; African horse sickness; classical and African swine fever; Newcastle disease and avian influenza are being mastered.

Appendix 4. Description of elective disciplines

1. Basic information about the discipline:	
Name of discipline	**Diagnosis and treatment of diseases of the reproductive organs**
2. Number of credits	6
3. Prerequisites**:**	Modern problems in veterinary medicine, methods of research in obstetrics
4. Post-requisites**:**	The study of the course "Diagnosis and treatment of diseases of the reproductive organs" forms the basis of professional competence of the researcher in the field of veterinary medicine
5. Competence**:**	PhD student should be able to apply clinical, laboratory, biophysical methods of diagnosis of diseases of the reproductive organs. Implement research in the field of diagnosis and treatment of diseases of the reproductive organs
6. The author of the course	Verterinary Medicine Department
7. Basic literature	1. Jakupov I. T. Early diagnosis of postpartum uterine abnormalities in cows. Astana, 2017. 94 PP. 2. Dulger G. P. "application of ultrasound diagnostics in the practice of cattle reproduction" Moscow, Russian state agrarian University named after K. A. Temiryazev, 2013.- 121 p. 3.GÜMBEL B, WEHREND A, BOSTEDT H (2005):Die Peritonitis beim Rind unterbesonderer Berücksichtigungge burtshilflicher Komplikationen Teil 1: PhysiologischeGrundlagen und UrsachenTierärztlichePraxis, 33, 12-20 4.WEHREND A, GROEGER S Verfahren der tierärztlichen Puerperalkontrolle und derenAuswirkungen auf die Fruchtbarkeit.Tierärztliche Praxis, 2008:36 (Suppl. 1), 20-24.
8. Content of the discipline. In the process of studying the discipline, modern methods of clinical and biophysical diagnostics and treatment of diseases of the uterus and ovaries, including ultrasound diagnostics, x-rays, and sonography are considered; the influence of dynamic electroneurostimulation of commercial devices on the reproductive function of animals is investigated; methods of increasing the reproductive and productive qualities of cows based on the use of biologically active substances are mastered	

1. Basic information about the discipline:	
Name of discipline	**Veterinary and technological methods to improve the reproductive function of animals**
2. Number of credits	6
3. Prerequisites**:**	The study course is based on the basic data of the achievements of veterinary obstetrics, gynecology, veterinary hygiene, internal non-communicable diseases, clinical diagnosis, veterinary surgery
4. Post-requisites**:**	The main production and scientific achievements in the field of biotechnology reproduction, veterinary medicine, the organization of reproduction of agricultural livestock.
5. Competence**:**	PhD student should be able to apply clinical, laboratory, biophysical methods of diagnosis of diseases of the reproductive organs. Implement research in the field of diagnosis and treatment of diseases of the reproductive organs
6. The author of the course	Department of veterinary medicine
7. Basic literature	1. Jakupov I. T. Early diagnosis of postpartum uterine abnormalities in cows. Astana, 2017. 94 PP. 2. Dulger G. P. "application of ultrasound diagnostics in the practice of cattle reproduction" Moscow, Russian state agrarian University named after K. A. Temiryazev, 2013.- 121 p. 3.GÜMBEL B, WEHREND A, BOSTEDT H (2005):Die Peritonitis beim Rind unterbesonderer Berücksichtigungge burtshilflicher Komplikationen Teil 1: PhysiologischeGrundlagen und UrsachenTierärztlichePraxis, 33, 12-20 4.WEHREND A, GROEGER S Verfahren der tierärztlichen Puerperalkontrolle und derenAuswirkungen auf die Fruchtbarkeit.Tierärztliche Praxis, 2008:36 (Suppl. 1), 20-24.
8. Content of the discipline. Modern methods of regulation of the reproductive function of animals. Correction of reproductive function by applying the methods of production and rearing. Correction of the reproductive function of the breeding stock using hormonal and antioxidant drugs. Methods for the prevention and treatment of obstetric pathology	

1. Basic information about the discipline:	
Name of discipline	Modeling of epidemiological processes in parasitic diseases
2. Number of credits	5
3. Prerequisites**:**	Theory and methods of experiment, Modern problems of veterinary medicine, Prevention and measures to control of zoonottic diseases, Protozooses of animals, birds and fish
4. Post-requisites**:**	Research practice. Dissertation
5. Competence**:**	In the process of learning, a doctoral student must know the principles of constructing and choosing the optimal models, be able to conduct biometric processing and interpretation of data; be competent in using software for analyzing the epidemiology of parasitic diseases.
6. The author of the course	Department of veterinary medicine
7. Basic literature	1 Palmer, S. R., Soulsby, Lord, Torgerson, P. R. and Brown, D. W. G. (eds) (2011). The Oxford Textbook of Zoonoses 2nd Edition. Oxford University Press , 884pp 2 Dwight D. Bowman. Georgis' Parasitology for Veterinarians, 10th Edition. – Philadelphia :Elsevier, 2014. – 484 p. 3 http://www.oie.int/fr/ 4 http://empres-i.fao.org/eipws3g/#h=0 5 http://openepi.com/Menu/OE_Menu.htm
8. Content of the discipline. Classification of models is studied, methods of simulation modeling of the epidemic process are mastered, area of applicability of simulation mathematical models and initial assumptions are specified. Examples of modeling the epidemic process of zoonotic invasions are given. Deterministic and stochastic models are considered. Effect of host population heterogenety on morbidity dynamics is evaluated. Numerical experiments on the simulation of parasitoses are conducted.	

1. Basic information about the discipline:	
Name of the discipline	**Mathematical epidemiology**
2. Credits number	5
3. Pre requisites:	Theory and methods of experiment, Modern problems of veterinary medicine, Prevention and control of zoonoses
4. Post requisites:	Research practice. Thesis of the research
5. Competences:	Using the epidemiological processes' models for organisation of optimal control measures, selection of fitting mathematical apparatus for model creation, practical skills for development and analysis of models in epidemiology.
6. Course author	Verterinary Medicine Department
7. Main literature	1 Palmer, S. R., Soulsby, Lord, Torgerson, P. R. and Brown, D. W. G. (eds) (2011). The Oxford Textbook of Zoonoses 2nd Edition. Oxford University Press , 884pp 2 Андерсон Р., Мэй Р. Инфекционные болезни человека. Динамика и контроль. М.:Мир, 2004. – 2004. – 784 с. 3 http://www.oie.int/fr/ 4 http://empres-i.fao.org/eipws3g/#h=0 5 http://openepi.com/Menu/OE_Menu.htm
8. The content of the discipline: Introduction to the mathematical epidemiology. Types of mathematical models for dynamics of infections. Deterministic population dynamics. Stochastic models of epidemiological processes. Imitation models with space structures. Individuals' oriented and multi agent modelling methods. Multi componential models. Using of models for prevention and control of infectious diseases. Modern problems of the mathematical epidemiology.	

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Head of the Veterinary Medicine Department, Doctor of Veterinary Science, Professor — Abdrakhmanov T. Zh.