

Документ подписан простой электронной подписью
Информация о владельце:
ФИО: Ястребов Олег Александрович
Должность: Ректор
Дата подписания: 09.06.2022 17:00:35
Уникальный программный ключ:
ca953a0120d891083f939673078ef1a989dae18a

**Federal State Autonomous Educational Institution for Higher Education PEOPLES'
FRIENDSHIP UNIVERSITY OF RUSSIA
Agrarian and Technological Institute**

WORKING COURSE SYLLABUS

Instrumental diagnostic methods

Recommended by the Methodological Council for the Education Field:

36.05.01 Veterinary medicine

1. GOALS AND OBJECTIVES OF THE DISCIPLINE

The aim of mastering the discipline "**Instrumental diagnostic methods**" is the formation of professional knowledge and skills for use in veterinary medicine of medical devices and methods designed for the diagnosis and differential diagnosis of diseases of various etiologies in animals. This is necessary for the veterinarian to correctly apply the methods and correctly interpret the results obtained, to scientifically substantiate his actions and decisions taken for the appointment and treatment of animals.

2. REQUIREMENTS FOR THE RESULTS OF MASTERING THE DISCIPLINE

The development of the discipline "**Instrumental diagnostic methods**" is aimed at creating the following competencies (parts of competencies) for students:

Table 2.1. List of competencies formed by students during the development of the discipline (results of the development of the discipline)

| Code | Competence | Indicators of competence accomplishment (within the discipline) |
|-------------|---|--|
| UK -12 | The ability to search for the necessary sources of information and data, to 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 information received to solve problems; to evaluate information, its reliability, build logical conclusions based on incoming information and data | UK -12.1 Searches for the necessary sources of information and data, perceives, analyzes, remembers and transmits information using digital means, as well as using algorithms when working with data obtained from various sources in order to effectively use the information received to solve problems |
| | | UK-12.2 Evaluates information, its reliability, builds logical conclusions based on incoming information and data |
| GPC -1 | The ability to determine the biological status and normative clinical indicators of organs and systems of the animal body. | GPC-1.1 Knows the structure and functions of the main systems of the animal body, taking into account the specific features |
| | | GPC-1.2 He s able to predict the expected violations of the biological status in case of suspected development of diseases |
| | | GPC-1.3 He is able to determine the main indicators of the activity of individual body systems and draw conclusions about the presence of deviations from the standard values |

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| | | GPC-1.4 Has the skills of sampling biological fluids and tissues for research, performing laboratory tests, interpreting research results. |
| GPC-2 | The ability to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological state of the animal organism. | GPC-2.1 Has knowledge of the influence of natural, socio-economic, genetic and economic factors on the animal body. |
| | | GPC-2.2 He is able to establish the presence and reliability of cause-and-effect relationships between the effects of certain etiological factors on the animal's body and the development of diseases. |
| | | GPC-2.3 Possesses methods of preventive and curative correction of the effects of adverse environmental factors that can cause deterioration of animal health. |
| GPC -4 | The ability to use methods of solving problems using modern equipment in the development of new technologies in professional activity and to use modern professional methodology for conducting experimental research and interpreting their results. | GPC-4.1 Possesses the conceptual and methodological apparatus of basic natural sciences at a level sufficient for full-fledged professional activity at the modern level. |
| | | GPC-4.2 He knows the methods of solving problems using modern equipment. |
| | | GPC-4.3 He is ready to use modern methodology in the development and conduct of experimental research. |
| | | GPC-4.4 Uses modern professional methodology in interpreting research results. |
| GPC -5 | The ability to draw up special documentation, analyze the results of professional activity and submit accounting documents using specialized databases. | GPC-5.1 Has the skills to search for the necessary forms of documentation on official websites and in specialized databases. |
| | | GPC-5.2 Possesses professional terminology and skills in filling out analytical and reporting documents of a professional orientation. |
| | | GPC-5.3 He is able to use specialized software to analyze the results of professional activity and compile accounting documentation. |
| GPC -6 | The ability to analyze, identify and assess the risk of the risk of the occurrence and spread of diseases. | GPC-6.1 Has knowledge in the field of etiology and pathogenesis of animal diseases of different species. |
| | | GPC-6.2 Has the skills to diagnose non- |

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| | | <p>infectious, infectious and invasive diseases, identify pathogens of infectious and invasive diseases in animals.</p> <p>GPC-6.3 He knows the patterns of the occurrence and spread of diseases in animal populations, factors predisposing to diseases and the causes of possible complications.</p> |
| GPC -7 | He is able to understand the principles of modern information technologies and use them to solve the tasks of professional activity. | <p>GPC-7.1 Understands the principles of modern computer technology and telecommunications and is able to use them to solve professional problems;</p> <p>GPC-7.2 Uses modern special software and specialized databases to solve professional tasks and perform official duties;</p> <p>GPC-7.3 Has the skills to work on modern medical diagnostic and therapeutic equipment with software;</p> <p>GPC-7.4 Uses specialized databases to solve professional problems in the field of diagnostics and treatment of animals of various species;</p> <p>GPC-7.5 Uses geoinformation systems and software complexes when collecting and analyzing information related to the assessment of the spread of infectious diseases, epizootic situations, planning and evaluating the effectiveness of anti-epizootic measures.</p> |
| PC -3 | Ability to develop animal research programs using special (instrumental) and laboratory methods. | <p>PC-3.1 He is able to develop individual animal research programs, including the use of special (instrumental) and laboratory methods to detect deviations from the physiological norm of the state of a living organism, conduct differential diagnosis of the detected pathology or control the course of the disease and the effectiveness of the prescribed treatment.</p> <p>PC-3.2 Capable of developing mass comprehensive animal research programs (medical examination programs) of animals, taking into account their type and purpose, both general and special.</p> |
| PC -4 | The ability to conduct clinical studies of animals using special (instrumental) and laboratory | PC-4.1 Able to conduct additional animal studies using laboratory methods to clarify the diagnosis. |

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| | methods to clarify the diagnosis. | PC-4.2 Able to conduct additional animal studies using special (instrumental) methods to clarify the diagnosis. |
| PC -14 | The ability to conduct repeated examinations and studies of animals to assess the effectiveness and safety of the prescribed treatment and adjust the treatment plan of animals (if necessary) based on the results of the evaluation of the effectiveness of treatment. | PC-14.1 He is able to develop a plan of repeated studies necessary and sufficient to assess the predicted changes in the patient's health. |
| | | PC-14.2 Able to conduct a repeated clinical examination, taking into account the specifics of diseases previously diagnosed in the patient. |
| | | PC-14.3 Able to carry out the necessary repeated instrumental and laboratory tests. |
| | | PC-14.4 He is able to analyze the identified changes, evaluate the effectiveness of the treatment and, if necessary, correct the prescribed course of treatment. |
| PC -18 | The ability to draw up a plan for the medical examination of animals, taking into account their types and purpose, to conduct medical examinations, to develop recommendations for carrying out preventive and curative measures based on the results of the examination of animals conducted as part of the medical examination | PC-18.1 He is able to make a plan for the medical examination of animals, general or specialized, taking into account their types and purpose |
| | | PC-18.2 He is able to organize and conduct medical examination according to the drawn up plan |
| | | PC-18.3 He is able, based on the results of medical examination, to give recommendations on the implementation of therapeutic and preventive and curative measures aimed at improving the health of a group of animals |

3. COURSE IN HIGHER EDUCATION

The discipline "**Instrumental diagnostic methods**" refers to the mandatory part of block B1 of the Educational Program of Higher Education.

As part of the Educational Program of Higher Education, students also master other disciplines and /or practices that contribute to achieving the planned results of mastering the discipline "**Instrumental diagnostic methods**".

Table 3.1. List of Higher Education Program components disciplines that contribute to expected learning outcomes

| Competence code | Competence | Previous Disciplines (Modules) | Subsequent Disciplines (Modules) |
|------------------------|---|---|--|
| UK -12 | The ability to search for the necessary sources of information and data, to 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 information received to solve problems; to evaluate information, its reliability, build logical conclusions based on incoming information and data | Jurisprudence Computer Science Philosophy Life Safety | Organization of veterinary business Forensic veterinary examination and autopsy of animals Mathematics Veterinary deontology Medicinal and poisonous plants Fundamentals of intellectual work Personality psychology and professional self-determination Clinical laboratory diagnostics Laboratory diagnostics of infectious and invasive diseases Organization of state veterinary supervision Veterinary and industrial laboratories with the basics of design Biometrics in veterinary medicine Fundamentals of social and legal knowledge Space technologies in the service of the agro-industrial complex |
| GPC -1 | The ability to determine the biological status and normative clinical indicators of organs and systems of the animal body. | Animal anatomy Cytology, histology and embryology Physiology and ethology of animals Pathological physiology Clinical diagnosis Pathological anatomy | Obstetrics, gynecology and andrology Immunology Clinical laboratory diagnostics Laboratory diagnostics of infectious and invasive diseases Veterinary and industrial laboratories with the basics of design Bee diseases and entomophages Fish pathology and aquaculture |

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| | | | Anesthesiology, intensive care and intensive care |
| GPC-2 | The ability to interpret and evaluate in professional activity the influence of natural, socio-economic, genetic and economic factors on the physiological state of the animal organism. | Biology with the basics of ecology Veterinary genetics Veterinary microbiology and mycology Virology and biotechnology Physiology and ethology of animals Breeding with the basics of private animal husbandry Animal health and welfare Pathological physiology Veterinary Radiobiology Pathological anatomy | Toxicology Obstetrics, gynecology and andrology Internal non-infectious diseases General surgery Private Veterinary surgery Parasitology and invasive diseases Epizootology and infectious diseases Forensic veterinary examination and autopsy of animals Immunology General and veterinary ecology Veterinary sanitation Forage plants Zoopsychology Animal Health Diseases of horses Diseases of productive animals Diseases of small pets Diseases of small pets Bee diseases and entomophages Fish pathology and aquaculture Diseases of exotic animals Anesthesiology, intensive care and intensive care Dermatology Cardiology Endocrinology Nephrology Veterinary Ophthalmology Animal Dentistry |
| GPC -4 | The ability to use methods of solving | Inorganic and analytical chemistry | Toxicology Obstetrics, gynecology |

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| | <p>problems using modern equipment in the development of new technologies in professional activity and to use modern professional methodology for conducting experimental research and interpreting their results.</p> | <p>Organic Chemistry Biological physics Computer science Physical and colloidal chemistry Cytology, histology and embryology Biological chemistry Veterinary microbiology and mycology Virology and biotechnology Physiology and ethology of animals Breeding with the basics of private animal husbandry Pathological physiology Veterinary Radiobiology Clinical diagnosis Pathological anatomy Operative surgery with topographic anatomy</p> | <p>and andrology Internal non-infectious diseases General surgery Private Veterinary surgery Parasitology and invasive diseases Epizootology and infectious diseases Mathematics Immunology Veterinary sanitation Technology of processing livestock products Medicinal and poisonous plants Forage plants Fundamentals of intellectual work Personality psychology and professional self-determination Clinical laboratory diagnostics Laboratory diagnostics of infectious and invasive diseases Diseases of horses Diseases of productive animals Diseases of small pets Diseases of small pets Bee diseases and entomophages Fish pathology and aquaculture Diseases of exotic animals Anesthesiology, intensive care and intensive care Dermatology Cardiology Endocrinology Nephrology Reconstructive and</p> |
|--|--|--|---|

| | | | |
|--------|---|---|--|
| | | | reconstructive surgery Veterinary Ophthalmology Animal Dentistry |
| GPC -5 | The ability to draw up special documentation, analyze the results of professional activity and submit accounting documents using specialized databases. | Veterinary genetics Computer science Breeding with the basics of private animal husbandry Clinical diagnosis Pathological anatomy Operative surgery with topographic anatomy | Obstetrics, gynecology and andrology Internal non-infectious diseases Parasitology and invasive diseases Epizootology and infectious diseases Veterinary and sanitary examination Organization of veterinary business Forensic veterinary examination and autopsy of animals Veterinary deontology Economics and organization of agricultural production Clinical laboratory diagnostics Laboratory diagnostics of infectious and invasive diseases Organization of state veterinary supervision Veterinary and industrial laboratories with the basics of design Anesthesiology, intensive care and intensive care Dermatology Cardiology Endocrinology Nephrology |
| GPC -6 | The ability to analyze, identify and assess the risk of the risk of the occurrence and spread of diseases. | Biology with the basics of ecology Life safety Veterinary microbiology and mycology Virology and biotechnology | Toxicology Obstetrics, gynecology and andrology Internal non-infectious diseases General surgery Private Veterinary surgery |

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| | | <p>Animal health and welfare Feeding animals with the basics of feed production Veterinary Radiobiology Clinical diagnosis Pathological anatomy</p> | <p>Parasitology and invasive diseases Epizootology and infectious diseases Veterinary and sanitary examination Organization of veterinary business Forensic veterinary examination and autopsy of animals Introduction to the specialty General and veterinary ecology Veterinary sanitation Technology of processing livestock products Medicinal and poisonous plants Forage plants Animal Health Clinical laboratory diagnostics Laboratory diagnostics of infectious and invasive diseases Organization of state veterinary supervision Diseases of horses Diseases of productive animals Diseases of small pets Diseases of small pets Bee diseases and entomophages Fish pathology and aquaculture Diseases of exotic animals Anesthesiology, intensive care and intensive care Veterinary Ophthalmology Animal Dentistry</p> |
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| | | | |
|--------|--|--|---|
| GPC -7 | He is able to understand the principles of modern information technologies and use them to solve the tasks of professional activity. | Computer science | Organization of veterinary business Mathematics Fundamentals of intellectual work Clinical laboratory diagnostics Laboratory diagnostics of infectious and invasive diseases Veterinary and industrial laboratories with the basics of design Anesthesiology, intensive care and intensive care Dermatology Cardiology Endocrinology Nephrology Reconstructive and reconstructive surgery |
| PC -3 | Ability to develop animal research programs using special (instrumental) and laboratory methods. | Animal anatomy Organic Chemistry Biological physics Physical and colloidal chemistry Biological chemistry Veterinary microbiology and mycology Virology and biotechnology Physiology and ethology of animals Pathological physiology Clinical diagnosis Pathological anatomy | Toxicology Obstetrics, gynecology and andrology Internal non-infectious diseases General surgery Private Veterinary surgery Parasitology and invasive diseases Epizootology and infectious diseases Immunology Veterinary deontology Clinical laboratory diagnostics Laboratory diagnostics of infectious and invasive diseases Veterinary and industrial laboratories with the basics of design Diseases of horses Diseases of productive animals Diseases of small pets |

| | | | |
|-------|--|---|---|
| | | | Diseases of small pets Bee diseases and entomophages Fish pathology and aquaculture Diseases of exotic animals Anesthesiology, intensive care and intensive care Dermatology Cardiology Endocrinology Nephrology Reconstructive and reconstructive surgery Veterinary Ophthalmology Animal Dentistry |
| PC -4 | The ability to conduct clinical studies of animals using special (instrumental) and laboratory methods to clarify the diagnosis. | Animal anatomy Biological physics Cytology, histology and embryology Biological chemistry Veterinary microbiology and mycology Virology and biotechnology Physiology and ethology of animals Pathological physiology Clinical diagnosis Pathological anatomy | Obstetrics, gynecology and andrology Internal non-infectious diseases General surgery Private Veterinary surgery Parasitology and invasive diseases Epizootology and infectious diseases Clinical laboratory diagnostics Laboratory diagnostics of infectious and invasive diseases Diseases of horses Diseases of productive animals Diseases of small pets Diseases of small pets Diseases of exotic animals Anesthesiology, intensive care and intensive care Dermatology Cardiology Endocrinology |

| | | | |
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| | | | Nephrology Veterinary Ophthalmology Animal Dentistry |
| PC -14 | The ability to conduct repeated examinations and studies of animals to assess the effectiveness and safety of the prescribed treatment and adjust the treatment plan of animals (if necessary) based on the results of the evaluation of the effectiveness of treatment. | Cytology, histology and embryology Physiology and ethology of animals Pathological physiology Veterinary Pharmacology Clinical diagnosis Pathological anatomy | Toxicology Obstetrics, gynecology and andrology Internal non-infectious diseases General surgery Private Veterinary surgery Parasitology and invasive diseases Epizootology and infectious diseases Clinical laboratory diagnostics Diseases of horses Diseases of productive animals Diseases of small pets Diseases of small pets Diseases of exotic animals Anesthesiology, intensive care and intensive care Dermatology Cardiology Endocrinology Nephrology Reconstructive and reconstructive surgery Veterinary Ophthalmology Animal Dentistry |
| PC -18 | The ability to draw up a plan for the medical examination of animals, taking into account their types and purpose, to conduct medical examinations, to develop recommendations for carrying out preventive and curative measures | Veterinary genetics Physiology and ethology of animals Breeding with the basics of private animal husbandry Animal health and welfare Feeding animals with the basics of feed production | Toxicology Obstetrics, gynecology and andrology Internal non-infectious diseases General surgery Private Veterinary surgery Animal Health Clinical laboratory diagnostics |

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| | based on the results of the examination of animals conducted as part of the medical examination | Pathological physiology Veterinary Pharmacology Clinical diagnosis Pathological anatomy | Diseases of horses Diseases of productive animals Diseases of small pets Diseases of small pets Diseases of exotic animals Dermatology Cardiology Endocrinology Nephrology Veterinary Ophthalmology Animal Dentistry |
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4. COURSE WORKLOAD AND TRAINING ACTIVITIES

Course workload of the discipline "**Instrumental diagnostic methods**" is 2 credits.

*Table 4.1. Types of academic activities during the period of the HE program mastering for **full-time** study*

| Types of academic activities | | HOURS | Semesters | | | | |
|--|--|---------------|-----------|-----------|---|---|---|
| | | | 6 | - | - | - | |
| Contact academic hours | | 54 | 54 | - | - | - | |
| including | | | | | | | |
| Lectures | | 18 | 18 | - | - | - | |
| Lab work | | 36 | 36 | - | - | - | |
| Seminars (workshops/tutorials) | | - | - | - | - | - | |
| Self-study | | 8 | 8 | - | - | - | |
| Evaluation and assessment (exam/pass/fail grading) | | 10 | 10 | - | - | - | |
| Course workload | | Academic hour | 72 | 72 | - | - | - |
| | | Credit unit | 2 | 2 | - | - | - |

*Table 4.2. Types of academic activities during the period of the HE program mastering for **part-time** study*

| Types of academic activities | | HOURS | Semesters | | | |
|------------------------------|--|-------|-----------|---|---|---|
| | | | 6 | - | - | - |
| Contact academic hours | | 54 | 54 | - | - | - |
| including | | | | | | |
| Lectures | | 18 | 18 | - | - | - |
| Lab work | | 36 | 36 | - | - | - |

| | | | | | | |
|--|--|---------------|-----------|-----------|---|---|
| Seminars (workshops/tutorials) | | - | - | - | - | - |
| Self-study | | 2 | 2 | - | - | - |
| Evaluation and assessment (exam/pass/fail grading) | | 16 | 16 | - | - | - |
| Course workload | | Academic hour | 72 | 72 | - | - |
| | | Credit unit | 2 | 2 | - | - |

5. CONTENT OF THE DISCIPLINE

Table 5.1 Content of the discipline (module) by type of academic work

| Name of the discipline section | Content of the section (topics) | Types of academic activities |
|---|---|-------------------------------------|
| Section 1. Introduction to instrumental diagnostics. X-ray diagnostics. | Topic 1.1 Introduction to instrumental diagnostics. | Lectures, Lab work. |
| | Topic 1.2 X-ray diagnostics. | Lectures, Lab work. |
| Section 2. Ultrasound examination. | Topic 2.1 Ultrasound examination. | Lectures, Lab work. |
| Section 3. Computer and magnetic resonance imaging. | Topic 3.1 Computed tomography. | Lectures, Lab work. |
| | Topic 3.2 Magnetic resonance imaging. | Lectures, Lab work. |
| Section 4. Electrocardiography, endoscopy and biopsy. | Topic 4.1 Electrocardiography. | Lectures, Lab work. |
| | Topic 4.2 Endoscopy. | Lectures, Lab work. |
| | Topic 4.3 Biopsy. | Lectures, Lab work. |

6. CLASSROOM INFRASTRUCTURE AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Material and technical support of the discipline

| | | |
|---|--------------------------------|--|
| <i>Classroom for Academic Activity Type</i> | <i>Equipping the classroom</i> | Specialized educational/laboratory equipment, software and materials for the development of the discipline (if necessary) |
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| Lecture | An auditorium for conducting lecture-type classes, equipped with a set of specialized furniture; a board (screen) and technical means of multimedia presentations. | - Portable ultrasound machine. - Endoscopic equipment. - Elektrokimograph. - Biochemical analyzer of blood, urine and hematological analyzer of blood (ILAB 650, PCE 90VET, etc.) |
| Laboratory | An auditorium for laboratory work, individual consultations, routine monitoring and interim certification, equipped with a set of specialized furniture and equipment. | - Portable ultrasound machine. - Endoscopic equipment. - Elektrokimograph. - Biochemical analyzer of blood, urine and hematological analyzer of blood (ILAB 650, PCE 90VET, etc.) |
| Self-studies | An auditorium for independent work of students (can be used for seminars and consultations), equipped with a set of specialized furniture and computers with access to an electronic information and educational environment. | - |

7. RECOMMENDED SOURCES FOR COURSE STUDIES

Main reading:

1. Ivanov A.A. Clinical laboratory diagnostics [Electronic resource] : Textbook / A.A. Ivanov. – St. Petersburg : Publishing House "Lan", 2017. - 432 p. http://lib.rudn.ru/MegaPro/UserEntry?Action=Rudn_FindDoc&id=465014&idb=0
2. Organization of veterinary business 2019.-300p. <https://e.lanbook.com/book/142440>

Additional Reading:

1. Ivanov V.P. Veterinary clinical radiology – St. Petersburg: Publishing House "Lan", 2014. – 624p. <https://e.lanbook.com/book/52618>
2. Kalyuzhny I.I., Shcherbakov G.G. Clinical gastroenterology of animals - St. Petersburg: Publishing House "Lan", 2015. – 448p. <https://e.lanbook.com/book/61362>
3. Workshop on clinical diagnostics with radiology Voronin E.S. et al.; ed. Voronina E.S., Snoz G. V. - M. : INFRA-M, 2014 - 335 p.
4. Lukinskaya N.M. Clinical diagnostics with radiology ; Ministry of Agriculture of the Russian Federation, FGOU VPO VGMHA, Vologda ; Dairy : IC VGMHA, 2011 - 10 p.
5. Ultrasound diagnostics of internal diseases of small pets/ Shabanov A.M. et al.; ed. Rakitskoy V.V. - M. : KolosS, 2005 - 135 p.
6. Blut Edward I., Benson Carol B., Ralls Philip W. Ultrasound diagnostics. Practical solution of clinical problems. - M.: Medical literature, 2014. - 176 p.

Resources of the Internet information and telecommunication network:

1. Electronic library system of RUDN and third-party Electronic library systems to which university students have access on the basis of concluded contracts:

- Electronic library system of RUDN - ELS RUDN <http://lib.rudn.ru/MegaPro/Web>
- ELS "University Library online" <http://www.biblioclub.ru>
- ELS Yurayt <http://www.biblio-online.ru>
- ELS "Student Consultant" www.studentlibrary.ru
- ELS "Lan" <http://eZlanbook.com/>
- ELS "Trinity Bridge" <http://www.trmost.com/>

2. Databases and search engines:

- electronic fund of legal and regulatory and technical documentation <http://docs.cntd.ru/>
- search engine Yandex <https://www.yandex.ru/>
- search engine Google <https://www.google.ru/>
- abstract database SCOPUS <http://www.elsevierscience.ru/products/scopus/>

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

1. A course of lectures on the discipline "**Instrumental diagnostic methods**".
2. Laboratory workshop on the discipline "**Instrumental diagnostic methods**".

* - All educational and methodological materials for independent work of students are placed in accordance with the current procedure on the discipline page in the **Telecommunication educational and Information System!**

8. MID-TERM ASSESSMENT

Evaluation materials and a point-rating system* for assessing the level of competence formation (part of competencies) based on the results of mastering the discipline "**Instrumental diagnostic methods**" are presented in the Appendix to this Work Program of the discipline.

* - Assessment Materials and a Point Rating System are formed based on the requirements of the relevant local regulatory act of the RUDN.

DEVELOPER:

Professor of the Department of Veterinary Medicine

Position, Basic curriculum

Signature

Vatnikov Yu.A.

Full name.

HEAD OF THE DEPARTMENT:

Department of Veterinary Medicine

Name Basic Curriculum

Signature

Vatnikov Yu.A.

Full name.

HEAD OF THE HIGHER EDUCATION PROGRAM:

Director of the Department of Veterinary Medicine

Position, Basic curriculum

Signature

Vatnikov Yu.A.

Full name