

Документ подписан простой электронной подписью  
Информация о владельце:  
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Должность: Ректор  
Дата подписания: 19.05.2023 16:30:33  
Уникальный программный ключ:  
ca953a0120d891083f939673078ef1a989dae18a

**Federal State Autonomous Educational Institution of Higher Education**  
**PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA**  
**RUDN University**

**Agrarian and Technological Institute**

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

**COURSE SYLLABUS**

**Cytology, histology and embryology**

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course title

**Recommended by the Didactic Council for the Education Field of:**

**36.05.01 Veterinary**

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field of studies / speciality code and title

**The course instruction is implemented within the professional education programme of higher education:**

**36.05.01 Veterinary**

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higher education programme profile/specialisation title

## 1. GOALS AND OBJECTIVES OF THE COURSE

The aim of mastering the course "**Cytology, histology and embryology**" is to study the structure of living matter normally at different levels of its organization: molecular, subcellular, cellular, tissue, systemic, organismal, as well as to study the patterns of development of tissues, organs and the body as a whole.

## 2. REQUIREMENTS FOR LEARNING OUTCOMES

The implementation of the course "**Cytology, histology and embryology**" 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 course (results of the development of the discipline)*

Competence code	Competence descriptor	Indicators of competence accomplishment (within the course)
PC-4	Ability to perform necessary laboratory diagnostics as part of preventive or diagnostic activities.	PC-4.2 Selects the appropriate type of laboratory diagnosis for the task at hand, taking into account knowledge of basic biological disciplines.
		PC-4.4 Interprets the results of diagnostics and uses them to solve the assigned task.

## 3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course "**Cytology, histology and embryology**" 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 course "**Cytology, histology and embryology**".

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

Competence code	Competence descriptor	Previous courses/modules, internships*	Subsequent courses/modules, internships*
PC-4	Ability to perform necessary laboratory diagnostics as part of preventive or diagnostic activities.	Biology with the basics of ecology	Clinical laboratory diagnostics Clinical internship Industrial practice Academic research practice with the preparation of a

			scientific qualification project Preparation for and passing the state exam
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#### 4. COURSE WORKLOAD AND TRAINING ACTIVITIES

Course workload of the course "Cytology, histology and embryology" is 7 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				
			2	3	-	-	
Contact academic hours		140	72	68	-	-	
including							
Lectures		35	18	17	-	-	
Lab work		105	54	51	-	-	
Seminars (workshops/tutorials)		-	-	-	-	-	
Self-study		86	-	86	-	-	
Evaluation and assessment (exam/pass/fail grading)		26	-	26	-	-	
<b>Course workload</b>		Academic hour	<b>252</b>	<b>72</b>	<b>180</b>	-	-
		Credit unit	<b>7</b>	<b>2</b>	<b>5</b>	-	-

#### 5. COURSE CONTENTS

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

Modules	Content of the modules (topics)	Types of academic activities
Module 1. Cytology, embryology and general histology	Topic 1.1. Cytology	Lectures, Lab work.
	Topic 1.2. Embryology	Lectures, Lab work.
	Topic 1.3. Epithelial tissues	Lectures, Lab work.
	Topic 1.4. Connective tissues	Lectures, Lab work.
	Topic 1.5. Muscle tissue	Lectures, Lab work.

		Topic 1.6. Nervous tissue	Lectures, Lab work.
Module 2. Private histology		Topic 2.1. Nervous system and sensory organs	Lectures, Lab work.
		Topic 2.2. Endocrine system	Lectures, Lab work.
		Topic 2.3. Circulatory system and organs of hematopoiesis	Lectures, Lab work.
		Topic 2.4. Digestive system	Lectures, Lab work.
		Topic 2.5. Respiratory organs	Lectures, Lab work.
		Topic 2.6. Skin and its derivatives	Lectures, Lab work.
		Topic 2.7. The genitourinary system	Lectures, Lab work.

## 6. COURSE EQUIPMENT 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>	<b>Specialized educational/laboratory equipment, software and materials for the development of the course (if necessary)</b>
Lecture	An auditorium for conducting lecture-type classes, equipped with a set of specialized furniture; a board (screen) and technical means of multimedia presentations.	<ul style="list-style-type: none"> <li>- Personal computer.</li> <li>- Multimedia equipment.</li> <li>- Information stands.</li> <li>- Biological microscopes.</li> <li>- Histological preparations</li> </ul>
Laboratory	An auditorium for laboratory work, individual consultations, routine monitoring and interim certification, equipped with a set of specialized furniture and equipment.	<ul style="list-style-type: none"> <li>- Personal computer.</li> <li>- Multimedia equipment.</li> <li>- Information stands.</li> <li>- Biological microscopes.</li> <li>- Histological preparations</li> </ul>
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.	
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## 7. RESOURCES RECOMMENDED FOR COURSE STUDIES

### *Main readings:*

1. Vasiliev Yu. G., Troshin E. I., Berestov D. S., Krasnoperov D. I. Cytology, histology, embryology: textbook 2020.-648 p.
2. Sokolov V. I. Cytology, histology and embryology / Sokolov V. I., Chumasov E. I., Ivanov V. S. – St. Petersburg: Quadro, 2020. – 384 p.
3. Botchey V.M. Fundamentals of cytology : textbook / Botchey V. M., Savrova O. B., Eremina I. Z., Fatkhudinov T. H. – M. : RUDN, 2020. – 76 p.

### *Additional Readings:*

1. Kuznetsov, C. L. Gistologiya, citologiya i embriologiya : textbook / s. L. Kuznetsov, N. N. Mushkambarov. - 2nd ed. ISP. and touch. - M. : Mia, 2012. - 640 s.
2. Histology. Embryology. Cytology [Text] : Textbook / N.V. Boychuk [et al.]; Edited by E.G. Ulumbekov, Yu.A. Chelyshev. - 4th ed., reprint. and additional - M. : GEOTAR-Media, 2016. - 928 p. : ill. - ISBN 978-5-9704-3782-7 : 0.00.
3. Bykov V.L. Histology, cytology and embryology. Atlas [Electronic resource] : Textbook / V.L. Bykov, S.I. Yushkantseva. - M. : GEOTAR-Media, 2015. - 296 p. - ISBN 978-5-9704-3201-3 <https://lib.rudn.ru/MegaPro/Web/SearchResult/ToPage/1>
4. Savrova O.B. Private histology [Electronic resource] : Lecture notes / O.B. Savrova, I.Z. Eremina. - Electronic text data. - Moscow : RUDN Publishing House, 2016. - 122 p. : ill. - ISBN 978-5-209-07294-2. <https://lib.rudn.ru/MegaPro/Web/SearchResult/ToPage/1>

### *Internet sources*

1. Electronic libraries (EL) of RUDN University and other institutions, to which university students have access on the basis of concluded agreements:

- RUDN Electronic Library System (RUDN ELS) <http://lib.rudn.ru/MegaPro/Web>
- EL "University Library Online" <http://www.biblioclub.ru>
- EL "Yurayt" <http://www.biblio-online.ru>
- EL "Student Consultant" [www.studentlibrary.ru](http://www.studentlibrary.ru)
- EL "Lan" <http://e.lanbook.com/>
- EL "Trinity Bridge"

### *2. Databases and search engines:*

- electronic foundation of legal and normative-technical documentation <http://docs.cntd.ru/>

- Yandex search engine [https:// www.yandex.ru/](https://www.yandex.ru/)
- Google search engine <https://www.google.ru/>
- Scopus abstract database <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 course "**Cytology, histology and embryology**".
2. Laboratory workshop on the course "**Cytology, histology and embryology**".

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

## **8. ASSESSMENT TOOLKIT AND GRADING SYSTEM\* FOR EVALUATION OF STUDENTS' COMPETENCES LEVEL AS COURSE RESULTS**

The assessment toolkit and the grading system\* to evaluate the level of competences (competences in part) formation as the course results are specified in the Appendix to the course syllabus.

\* The assessment toolkit and the grading system are formed on the basis of the requirements of the relevant local normative act of RUDN University (regulations / order).

### **DEVELOPER:**

Associate Professor of the Department of Veterinary  
Medicine

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Position, Basic curriculum

Signature

Rystsova E.O.

\_\_\_\_\_  
Full name.

### **HEAD OF EDUCATIONAL DEPARTMENT:**

Department of Veterinary Medicine

\_\_\_\_\_  
Name Basic Curriculum

Signature

Vatnikov Yu.A.

\_\_\_\_\_  
Full name.

### **HEAD OF HIGHER EDUCATION PROGRAMME:**

Director of the Department of Veterinary Medicine

\_\_\_\_\_  
Position, Basic curriculum

Signature

Vatnikov Yu.A.

\_\_\_\_\_  
Full name