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

RUDN University

Institute of Medicine

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

COURSE SYLLABUS

Histology, Embryology, Cytology

course title

Recommended by the Didactic Council for the Education Field of:

31.05.01 General Medicine

field of studies / speciality code and title

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

General Medicine

higher education programme profile/specialisation title

2024

1. COURSE GOAL(s)

The aim of the course "Histology, embryology, cytology" is to acquire knowledge about the structure of living matter normally at different levels of its organization: molecular, subcellular, cellular, tissues, organ's systems, as well as the study of patterns of development of tissues, organs and organism as a whole based on modern achievements of histology and embryology.

2. REQUIREMENTS FOR LEARNING OUTCOMES

The mastering of the discipline "**Histology, embryology, cytology"** is aimed at the formation of the following competencies among students:

General Professional Competences- (GPC)-5

(in accordance with the Federal State Educational Standard of Higher Education (FSES) 3++ 31.05.01 General Medicine).

Table 2.1. The list of competencies formed by students during the development of the discipline (results of the mastering of the discipline)

Competence code	**Competence**	**Indicators of competence formation** (within the framework of this discipline)
GPC-5	Able to assess morpho-functional, physiological states and pathological processes in the human body to solve professional problems	GPC-5.3. A student should able to determine morpho-functional, physiological states and pathological processes of the human body

3. COURSE IN THE HIGHER EDUCATION PROGRAMME STRUCTURE

The course **"Histology, embryology, cytology"** refers to the Compulsory Disciplines of block B1 of the EP HE.

Within the framework of the Educational Program, students also master other disciplines and/or practices that contribute to expected learning outcomes of the course "Histology, Embryology, Cytology".

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

Code	Name of the competence	Previous Disciplines	Subsequent disciplines /modules, practices
GPC-5	Able to assess morphofunctional, physiological states and pathological processes in the human body to solve professional problems	Anatomy Biology	General pathology and pathologic physiology; Pathologic anatomy General and clinical pharmacology; Forensic medicine; Neurology; Obstetrics and gynecology

4. THE DISCIPLINE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the discipline "**Histology, embryology, cytology"** is equal to 7 credits.

Table 4.1. Types of academic activities during the period of the HE program mastering

Types of academic activities		**TOTAL, academic hours** (ac.h)	**semesters**	
			2	**3**
Classroom learning *, ac.h.*		**170**	**85**	**85**
Lectures (**Lec**)		**34**	**17**	**17**
Laborarory works (**Lab**)		**136**	**68**	**68**
Practical/seminar classes		-	-	-
Self-studies, academic hours		*46*	*14*	*32*
Evaluation and assessment (exam or pass/fail grading)		*36*	*9*	*27*
Total workload of the discipline	ac.h.	**252**	**108**	**144**
	credits	**7**	**3**	**4**

5. THE CONTENT of the DISCIPLINE

Table 5.1. The content of the discipline by typeы of academic work

Name of the discipline section	**Content of the section (topic)**	**Type of** academic activities
Section 1 Introduction to the discipline. Research methods	**Topic 1.1.** Methods of histological, cytological and embryological studies	**Lec, Lab**
Section 2 Cytology.	**Topic 2.1**. The doctrine of the cell. Cell structure	**Lec, Lab**
	Topic 2.2. Organelles and inclusions	**Lec, Lab**
	Topic 2.3. Nucleus: structure, functions. Cell cycle	**Lec, Lab**

Name of the discipline section	Content of the section (topic)	Type of academic activities
Section 3 Basic Histology.	**Topic 3.1.** The concept of tissues. Epithelia. Glands.	**Lec, Lab**
	Topic 3.2. The system of the internal environment tissues. Blood and lymph. Hematopoiesis.	**Lec, Lab**
	Topic 3.3. Connective tissues. Connective tissue proper. Connective tissues with special properties.	**Lec, Lab**
	Topic 3.4. Skeletal connective tissues. Cartilage. Bone tissues.	**Lec, Lab**
	Topic 3.5. Muscle tissues	**Lec, Lab**
	Topic 3.6. Nerve tissue	**Lec, Lab**
Section 4 Histology of organs and organ systems	**Topic 4.1.** Nerve System	**Lec, Lab**
	Topic 4.2. Sensory system(Organs of special senses)	**Lec, Lab**
	Topic 4.3. Circulatory system	**Lec, Lab**
	Topic 4.4. System of organs of hematopoiesis and immune defense	**Lec, Lab**
	Topic 4.5. Endocrine system	**Lec, Lab**
	Topic 4.6. Digestive system	**Lec, Lab**
	Topic 4.7. Respiratory system	**Lec, Lab**
	Topic 4.8. Skin and its derivatives	**Lec, Lab**
	Topic 4.9. Urinary system	**Lec, Lab**
	Topic 4.10. Reproductive system	**Lec, Lab**
Section 5 Embryology	**Topic 5.1**. Basic (Comparative) Embryology	**Lec, Lab**
	Topic 5.2. Bases of Human Embryology	**Lec, Lab**

6. MATERIAL and TECHNICAL SUPPORT of the DISCIPLINE

Table 6.1. Material and technical support of the discipline

Classroom for Academic Activity Type	**Classroom Equipment**	**Specialized educational/laboratory equipment, software and materials for the mastering of the discipline**
Learning-and Research Lab	Medical Biotechnologies Lab equipped with a set of specialized furniture and lab equipment; (classrooms 316, 318)	Laboratory CO2- incubators Shellab, laminar-flow cabinet series Biowizard ,

Classroom for Academic Activity Type	**Classroom Equipment**	**Specialized educational/laboratory equipment, software and materials for the mastering of the discipline**
		microscope “Leica Microsystem CMC», inverted microscope Leica DMi8, automatic cell counter TC20, laboratory microcentrifuge MiniSpin, abacterial box, flow cytometer, freezer compartment UF V 700, cellular analyzer xCELLigence, flatbed monochromator fluorimeter, cytofluorimeter cell sorter, the Lab of a full cycle of histological tissue processing..
Specialized Lab work	Classroom for lab work, individual consultations, self-studies equipped with a set of specialized furniture; whiteboard; light microscopes and a set of devices (classrooms 221, 223, 224, 228, 332).	Microscopes “МИКМЕД-5”, technical equipment: multimedia projector BenQ Projector MX 525, projection screen, laptop ASUS X515JP-BQ029T, computer Lenovo V530S-071CB with stable Internet connection. Software: Microsoft Windows, MS Office / Office 365, MS Teams, Chrome (latest stable release), sets of histological preparations, microphotographs, a list of stands, tables, visual posters, etc
For students self-studies	Classroom for self-studies of students (can be used for seminars and consultations), equipped with a set of specialized furniture, microscopes and computers with stable wireless Internet connection. (classrooms 223, 332).	Microscopes “МИКМЕД-5”, technical equipment: multimedia projector BenQ Projector MX 525, projection screen, laptop ASUS X515JP-BQ029T, computer Lenovo V530S-071CB with stable Internet connection. Software: Microsoft Windows, MS Office / Office 365, MS Teams, Chrome (latest stable release), sets of histological preparations, microphotographs, a list of stands, tables, visual posters, etc

7. EDUCATIONAL, METHODOLOGICAL and INFORMATION SUPPORT of the DISCIPLINE

Main reading

1. Kierszenbaum A. L. Histology and Cell Biology. An Introduction to Pathology / A.L. Kierszenbaum, L.L. Tres. - Fourth Edition ; - Philadelphia : Elsevier, 2016. - 734 p. : ill. - ISBN 978-0-323-31330-8 : 8893.12.
2. Kuznetsov S. L.. Histology, Cytology and Embriology : (a course of lectures) / S.L. Kuznetsov, T.V. Boronikhina, V.L. Goryachkina ; edited by Babchenko E.V. - 2nd edition ; - Moscow : Medical Informational Agency, 2019. - 240 p. - ISBN 978-5-907098-08-4: 798.00.
3. Lowe James S.Stevens & Lowe Human Histology / J.S. Lowe, P.G. Anderson. - Fourth Edition ; Philadelphia : Elsevier, 2015. - 429 p. : il. - ISBN 978-0-723-43502-0 : 8070.94.
4. Botchey V.M., Savrova O.B., Eremina I.Z. Basic Cytology: the course of lectures / M.: PFUR, 2022. – 56 p. - ISBN 978-5-209-11049-1.
5. Botchey V.M., Savrova O.B., Eremina I.Z. Embryology: the course of lectures / M.: PFUR, 2022. – 44 p. - ISBN 978-5-209-11050-7.
6. Botchey V.M., Savrova O.B., Eremina I.Z. Basic Histology: the course of lectures / M.: PFUR, 2022. - 64 p.: il. - ISBN 978-5-11048-4.
7. Savrova O.B., Eremina I.Z., Botchey V.M. Histology: Organ Systems. - M.: PFUR, 2019. - 168 c. - ISBN 978-5-209-08576-8.
8. Savrova O.B., Botchey V.M Eremina I.Z. Systemic Histology. Part 1 - M: PFUR, 2018. – 79 p. – Appl. - ISBN 978-5-209-08540-3.
9. Savrova O.B., Botchey V.M Eremina I.Z. Systemic Histology. Part 2. - M: PFUR, 2018. – 88 p. – Appl. - ISBN 978-5-209-08539-3.

Additional reading:

Electronic full-text materials:

1. Savrova O. B., Eremina I.Z. Cytology. Embryology: the course of lectures[Electronic resource] / ; - M. : PFUR, 2016. - 76 p. : il. - ISBN 978-5-209-07391-8.
2. O.B.Savrova, V.M.Botchey, I.Z Eremina. Basic Cytology [Electronic resource] = Цитология: Course of lectures for students of English-media groups / M.: PFUR, 2019.
3. Savrova O.B., Botchey V.M., Eremina I.Z. Systemic histology: course of lectures for students of English-media groups. P. 1 / O.B. Savrova, V.M. Botchey, I.Z. Eremina. - M.: PFUR, 2018. - 81 p. : и. - ISBN 978-5-209-08539-3. - ISBN 978-5-209-08540-9 (P. 1).
4. Savrova O.B., Botchey V.M., Eremina I.Z. Systemic histology : course of lectures for students of English-media groups. P. 2 / O.B. Savrova, V.M. Botchey, I.Z. Eremina. - [Electronic resource] . - M. : PFUR, 2018. - 80 p.. - ISBN 978-5-209-08539-3. - ISBN 978-5-209-08812-7 (P. 2).

***Printed publications*:**

1. Junqueria's Basic Histology: Text and Atlas, 16th Ed by A.Mescher, 2019
2. Stevens A. Human Histology, 3d Edition /Elseiver – London
3, Johnson Ph.D, Kurt E. Histology and cell biology, 2-d Ed./ Harwal Publishing Company – Baltimore
4. Ross M.H., Pawlina W. Histology: A Text and Atlas, 7th Ed, 2018
5. Gartner L.P., Hiatt J.L. Color Atlas and Text of Histology
7. Paul R. Wheater, H. George Burkitt, Victor G. Daniels. Functional Histology: a text and colour atlas. - Churchill Livingstone Inc. - 1987.
8. Wheater, Paul R. Functional Histology: a text and colour atlas. - 5nd ed. Longman Group UK Limited.

9. Histology, Cytology, Embryology: manual to Laboratory Classes. P.1 / V.M. Botchey, O.B. Savrova, I.Z. Eremina, V.M. Grinberg; э - M.: PFUR, 2020. - 37 p. - ISBN 978-5-209-09801-0. - ISBN 978-5-209-09802-7 (ч. I).

10. Histology, Cytology, Embryology: manual to Laboratory Classes. P.2/ V.M. Botchey, O.B. Savrova, I.Z. Eremina, V.M. Grinberg, A.A.Lapshin; - M.: PFUR, 2023. - 55 p. - ISBN 978-5-209-11923-0. - ISBN 978-5-209-09802-7 (ч. III).

Internet (based) sources

- 1. Electronic libraries with access for RUDN students:
  -Electronic library network of RUDN – ELN RUDN http://lib.rudn.ru/MegaPro/Web
  - ELN «University Library online» http://www.biblioclub.ru
  - ELN Urait http://www.biblio-online.ru
  - ELN «Student Advisor» www.studentlibrary.ru
  - ELN «Lan» http://e.lanbook.com/

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

Learning toolkits for self-studies during the development of the discipline

1. Lectures Synopsis on the discipline "Histology, embryology, cytology".
2. Methodological guidelines for the implementation and execution of control and independent work on the discipline "Histology, embryology, cytology"

* - All teaching materials for self-studing of students are placed in accordance with the current procedure on the discipline page in the RUDN LMS TUIS.

8. ASSESSMENT MATERIALS and POINT-RATING SYSTEM for ASSESSING the LEVEL of COMPETENCE FORMATION in the DISCIPLINE

Assessment materials and a point-rating system for assessing the level of competence formation (part of competencies) based on the results of mastering the discipline "**Histology, embryology, cytology**" are presented in the Appendix to this Work Program of the discipline.

PROGRAM DEVELOPERS:

Associate Professor of the Department of Histology, Cytology and Embryology		I.Z. Eremina
		O.B.Savrova

Associate Professor of the
Department of Histology, Cytology
and Embryology

HEAD of the Department:
of Histology, Cytology and
Embryology T.Kh. Fatkhudinov

HEAD of the EP HE
Head of the Department of General Medical Practice: N.V.Sturov