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

Medical Elementology

course title

Recommended by the Didactic Council for the Education Field of:

31.05.03 DENTISTRY

field of studies / speciality code and title

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

DENTISTRY

higher education programme profile/specialisation title

2022

1. COURSE GOAL(s)

The goal of the course "Medical Elementology" is to equip students with the knowledge of biological role of macro- and microelements and their implications for human health, formate of clinical thinking in students for diagnosis, evaluation of disease prognosis and successful treatment; applicate of new methods and schemes of correction of various metabolic disorders and pathological processes.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course (module) "Medical Elementology" is aimed at the development of the following competences /competences in part: **(GPC)-8,9, (PC)-1,11.**

Table 2.1. List of competences that students acquire through the course study

Competence code	**Competence descriptor**	**Competence formation indicators** (within this course)
GPC-8	GPC-8 Able to analyze the results of their own activities to prevent professional errors; readiness to use basic physical, chemical, mathematical and other natural science concepts and methods in solving professional problems	GPC-8 Students should be able to analyze the results of their own activities to prevent professional errors; readiness to use basic physical, chemical, mathematical and other natural science concepts and methods in solving professional problem
GPC-9	GPC-9 able for medical use of drugs and other substances and their combinations in solving professional problems	GPC-9 Students should be able for medical use of drugs and other substances and their combinations in solving professional problems
PC-1	P-11 Able to implement a set of measures aimed at maintaining and strengthening health, including the formation of a healthy lifestyle, preventing the occurrence and (or) spread of dental diseases, their early diagnosis, identifying the causes and	PC-1 Students should be able to implement a set of measures aimed at maintaining and strengthening health, including the formation of a healthy lifestyle, preventing the occurrence and (or) spread of dental diseases, their early diagnosis, identifying the causes and conditions for their emergence and development, as well as on elimination of harmful influence on human health of factors of its habitat

Competence code	Competence descriptor	Competence formation indicators (within this course)
	conditions for their emergence and development, as well as on elimination of harmful influence on human health of factors of its habitat	
PC-11	PC-11 collecting and analyzing patient complaints, data of his medical history, examination results, laboratory, instrumental and other studies for the purpose of recognizing the condition or establishing the presence or absence of a dental disease; readiness to determine the need for natural therapeutic factors, medicinal, non-medicinal therapy and other methods in patients with dental diseases who need medical rehabilitation and sanatorium treatment	PC-11 Students should be able to collecting and analyzing patient complaints, data of his medical history, examination results, laboratory, instrumental and other studies for the purpose of recognizing the condition or establishing the presence or absence of a dental disease; readiness to determine the need for natural therapeutic factors, medicinal, non-medicinal therapy and other methods in patients with dental diseases who need medical rehabilitation and sanatorium treatment

3.COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course refers to the core/variable/elective* component of (B1) block of the higher educational programme curriculum.

* - Underline whatever applicable.

Within the higher education programme students also master other (modules) and / or internships that contribute to the achievement of the expected learning outcomes as results of the course study.

Table 3.1. The list of the higher education programme components/disciplines that contribute to the achievement of the expected learning outcomes as the course study results

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
GPC-8	GPC-8 Able to analyze the results of their own activities to prevent professional errors; readiness to use basic physical, chemical, mathematical and other natural science concepts and methods in solving professional problems	-	-
GPC-9	GPC-9 able for medical use of drugs and other substances and their combinations in solving professional problems	-	-
PC-1	PC-1 Able to implement a set of measures aimed at maintaining and strengthening health, including the formation of a healthy lifestyle, preventing the occurrence and (or) spread of dental diseases, their early diagnosis, identifying the causes and conditions for their emergence and development, as well as on elimination of harmful influence on human health of factors of its habitat	-	-
PC-11	PC-11 collecting and analyzing patient complaints, data of his medical history, examination results, laboratory, instrumental and other studies for the	-	-

Competence code	Competence descriptor	Previous courses/modules*	Subsequent courses/modules*
	purpose of recognizing the condition		

4. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the course is 2 credits (72 academic hours).

*Table 4.1. Types of academic activities during the periods of higher education programme mastering (**full-time training**)**

Type of academic activities		Total academic hours	Semesters/training modules			
			3			
Contact academic hours		**28**	**28**			
including:		-	-			
Lectures (LC)		-	-			
Lab work (LW)		28	28			
Seminars (workshops/tutorials) (S)			-			
Self-studies		**38**	**38**			
Evaluation and assessment (exam/passing/failing grade)		**6**	**6**			
Course workload	academic hours	**72**	**72**			
	credits	**2**	**2**			

5. COURSE CONTENTS

Table 5.1. Course contents and academic activities types

Course module title	Course module contents (topics)	Academic activities types
Introduction to Medical Elementology	Subject of medical elementology. Biological classification of chemical elements. The concept of bioelements.	LW
	Biogeochemistry and factors affecting the elemental status of the population.	LW
General Elementology	Factors affecting the homeostasis of microelements. Interaction between microelements	LW
	Elemental status of a person. Personalized assessment of human elemental status.	LW
Particular Elementology	Elements-organogenes (carbon, oxygen, nitrogen, hydrogen): a role in the body; suction; excretion; associated diseases; sources.	LW
	Macroelements (potassium, sodium, calcium, magnesium, phosphorus, sulfur, chlorine): role in	LW

Course module title	Course module contents (topics)	Academic activities types
	the body; suction; excretion; deficiency and excess; toxicity; associated diseases; sources.	
	Essential trace elements (iron, zinc, copper, manganese, chromium, cobalt, molybdenum, selenium, iodine): role in the body; suction; excretion; deficiency and toxicity; associated diseases; sources.	LW
	Conditionally essential microelements (lithium, strontium, vanadium, nickel, tin, silicon, fluorine): role in the body; suction; excretion; deficiency and toxicity; associated diseases; sources	LW
	Toxic and potentially toxic microelements (arsenic, aluminum, lead, cadmium, mercury): role in the body; suction; excretion; toxicity; associated diseases; sources.	LW
The role of chemical elements in dentistry	Imbalances of chemical elements for various diseases of the oral cavity: caries, pulpitis, periodontitis, gingivitis, periodontitis, periodontitis	LW

6. CLASSROOM EQUIPMENT AND TECHNOLOGY SUPPORT REQUIREMENTS

Table 6.1. Classroom equipment and technology support requirements

Type of academic activities	**Classroom equipment**	**Specialised educational / laboratory equipment, software, and materials for course study** (if necessary)
Lecture	A lecture hall for lecture-type classes, equipped with a set of specialised furniture; board (screen) and technical means of multimedia presentations.	
Lab work	A classroom for laboratory work, individual consultations, current and mid-term assessment; equipped with a set of specialised furniture and machinery.	List of specialised laboratory equipment, machinery, stands, etc.
Seminar	A classroom for conducting seminars, group and individual consultations, current and mid-term assessment; equipped with a set of specialised furniture and technical means for multimedia presentations.	List of specialised equipment, stands, visual posters, etc.
Computer Lab	A classroom for conducting classes, group and individual consultations, current and mid-term assessment, equipped with personal computers (in the amount of ____pcs), a board (screen) and	List of specialised software installed on computers for mastering the discipline

Type of academic activities	Classroom equipment	Specialised educational / laboratory equipment, software, and materials for course study (if necessary)
	technical means of multimedia presentations.	
Self-studies	A classroom for independent work of students (can be used for seminars and consultations), equipped with a set of specialised furniture and computers with access to the electronic information and educational environment.	

7. RESOURCES RECOMMENDED FOR COURSE STUDY

Main readings

1) An Introduction to Medical Elementology: A Textbook. I.V. Radysh, A.V. Rocky. - Moscow: PFUR, 2015. - 200 p.: ill. ISBN 978-5-209-06691-0.

2) Oberlis D., Harland V., Skalny A. Biological role of macro and microelements in humans and animals. - SPb.: Science, 2008. - 544 p.

3) Skalny A.V., Lakarova E.V., Kuznetsov V.V., Skalnaya M.G. Analytical methods in bioelementology. - St. Petersburg: Science, 2009. – 264 p.

Additional readings

1) World Health Organization. (1996). Trace elements in human nutrition and health.

2) Skalny A.V. Bioelements and bioelementology in pharmacology and nutrition: fundamental and practical aspects // Pharmacology and nutritional intervention in the treatment of disease, Edited by Faik Atroshi. 2014.-P. 225-241.

3) Skalny A.V., Rudakov I.A. Notova S.V., Burtseva T.I., Skalny V.V., Baranova O.V., Gubaydulina S.G., Bioelementology: basic concepts and terms. IPK GOU OSU - Orenburg. - 2005. – 50 p.

4) Ibragimova M.Ya., Skalnaya M.G., Sabirova L.Ya., Skalny A.V., Zhdanov R.I. Exchange of macro and microelements in the human body. Modern methods of determining chemical elements in biological materials / Selected chapters of fundamental and translational medicine. R.I. Zhdanov, the manager. Ed. - Kazan: Kazan Publishing House. University. 2014. P. 330-346.

5) Skalny A.V. Microelements // Laboratory diagnostics of infectious diseases. Reference book / Ed. IN AND. Pokrovsky, M.G. Tvorogovoy, G.A. Shipulina. - Moscow: Publishing House BINOM, 2013 - 447- 467p.

6) Skalny A.V., Tsygan V.N. Pathophysiology of macro-and microelement exchange // Pathophysiology of Metabolism: a Textbook / Ed. V.N. Gypsy. - St. Petersburg: SpetsLit, 2013. - P. 262-333.

7) Skalny A.V. Chemical elements in human physiology and ecology. -M .: ONYX 21 Century: The World, 2004. -216 p.

8) Skalny A.V. Physiological aspects of the application of macro- and microelements. IPK GOU OSU - Orenburg, 2005. - 206 p.

9) Agadzhanyan N.A., Veldanova M.V., Skalny A.V. Ecological portrait of man and the role of microelements. -M., 2001. -236 p.

10) Skalny A.V., Rudakov I.A. Bioelements in medicine. -M.: ONYX 21 Century: The World, 2004. -272 p.

*Training toolkit for self- studies to master the course *:*

1. The set of lectures on the course “Medical Institute”

2. The laboratory workshop (if any).on the course “Medical Institute”

3. The guidelines for writing a course paper / project (if any) on the course “Medical Institute”.

4. ……

* The training toolkit for self- studies to master the course is placed on the course 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 UPON COURSE COMPLETION

The assessment toolkit and the grading system* to evaluate the competences formation level (**(GPC)-8,9, (PC)-1,11.**) upon the course study completion 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).

DEVELOPERS:

Senior Lecturer of Department of Medical Elementology		A.A. Skalny
position, department	signature	name and surname
Head of the Department of Medical Elementology		A.V. Skalny
position, department	signature	name and surname

HEAD OF EDUCATIONAL DEPARTMENT:

of the Department of Medical Elementology		A.V. Skalny
name of department	signature	name and surname

HEAD

OF HIGHER EDUCATION PROGRAMME:

Deputy Director of the Medical Institute

		I.V. Radysh
position, department	signature	name and surname