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**Federal State Autonomous Educational Institution of Higher Education
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA
NAMED AFTER PATRICE LUMUMBA
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

1. COURSE GOAL(s)

The course "Medical Elementology" is included in the specialty program "Dentistry" in the direction of 31.05.03 "Dentistry" and is studied in the 1st semester of the 1st year. The discipline is implemented by the Department of Medical Elementology. The discipline consists of 4 sections and 10 topics and is aimed at studying the biological role of micro-and macronutrients and their significance for human health

The purpose of mastering the course is to develop students' competencies in assessing morphofunctional and physiological conditions, as well as pathological processes associated with the elemental status of a person, and apply this knowledge in clinical, laboratory and functional diagnostics, including the use of artificial intelligence technologies, as well as in developing personalized nutrition strategies, therapy and prevention of diseases based on biogeochemical data. and elementological principles.

2. REQUIREMENTS FOR LEARNING OUTCOMES

Mastering the course "Medical Elementology" is aimed at developing the following competencies (parts of competencies) in students:

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

Cipher	Competence	Indicators of achievement of competence (within the given discipline)
GC-1	is able to perform a critical analysis of problem situations based on a systematic approach, develop an action strategy	GC-1.3 Critically evaluates the reliability of information sources, works with conflicting information from different sources;
PC-2	is able to prescribe, monitor the effectiveness and safety of non-drug and drug treatment	PC-2.3 Advises the patient on methods of treatment of dental diseases drawing up a comprehensive treatment plan with justification of the most appropriate tactics and evaluating possible complications caused by the use of this technique;

3. COURSE IN HIGHER EDUCATION PROGRAMME STRUCTURE

The course 'History of Medicine' 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*
GC-1	is capable of performing critical analysis		of Human Anatomy; Gnatology and

	<p>problem situations based on a systematic approach, develop an action strategy</p>		<p>functional diagnostics of the temporal mandibular joint; Pediatric dentistry; Pediatric maxillofacial surgery; Dental prosthetics (simple prosthetics); Immunology, clinical immunology; Medical genetics in dentistry; Orthodontics and pediatric prosthetics; Otorhinolaryngology; Dentition (complex prosthetics). prosthetics); Prosthetics in the complete absence of teeth; Psychology, pedagogy; Philosophy; Maxillofacial prosthetics; Obstetrics; Pathophysiology - Pathophysiology of the head and neck; Medical rehabilitation; Evidence-based medicine; History of medicine; Socially significant projects in medicine; Assistant to a dentist (therapist); Assistant to a dentist (orthopedist);</p>
<p>PC-2</p>	<p>is capable of prescribing, monitoring the effectiveness and safety of non-drug and drug treatment</p>		<p>Assistant to a dentist (surgeon); Assistant to a dentist (general practice), including research work; Assistant to a dentist (therapist); Assistant to a dentist (children's); Children's dentistry; Diseases of the head and neck; Implantology and reconstructive surgery of the oral cavity; Cariesology and diseases of the hard tissues of the teeth; Local anesthesia and anesthesiology in dentistry; Orthodontics and children's prosthetics;</p>

			<p>Oral surgery; Maxillofacial and gnatic surgery; Gerontostomatology and diseases of the oral mucosa; Periodontology; Endodontics; <i>Modern endodontics**</i>; Innovative technologies in dentistry; Physiotherapy of dental diseases; Clinical pharmacology;<i>Aesthetic restoration of teeth**</i>; Clinical Dentistry; Propaedeutics of dental diseases; Gnatology and functional diagnostics of the temporal mandibular joint; Children's maxillofacial surgery; Dental prosthetics (simple prosthetics); Medical genetics in dentistry; Dentition (complex prosthetics); Prosthetics in the complete absence of teeth; Maxillofacial prosthetics; Infectious diseases, phthisiology; Organization of general patient care;</p>
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* - filled in in accordance with the matrix of competencies and SUP of the OP HE

** - elective subjects /practices

3. COURSE WORKLOAD AND ACADEMIC ACTIVITIES

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

Table 4.1. Types of academic work by periods of development of the educational program of higher education for full-time education.

Type of academic activities	Total academic hours		Semesters/training modules
			1
<i>Contact work, ac.h.</i>	51		51
Lectures (LC)	0		0
Lab work (LW)	0		0
Seminars (workshops/tutorials) (S)	51		51
<i>Self-studies</i>	15		15
<i>Evaluation and assessment (exam/passing/failing grade)</i>	6		6
Course workload	ac. h.	72	72
	cred. unit	2	2

5. COURSE CONTENTS

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

Course module title	Course module contents (topics)	Academic activities types
Section 1 Introduction to bioelementology	1.1 Subject and basic concepts of medical elementology Subject of medical elementology. Biological classification of chemical elements. The concept of bioelements.	S
	1.2 Biogeochemistry and factors of the population's elemental status Biogeochemistry and factors affecting the population's elemental status.	S
	1.3 A new paradigm of nutrition and therapy. Nutrition and Therapy in	S
Section 2 Elementology General Elementology	2.1 Personalized assessment of a person's elemental status. Personalized assessment of a person's elemental status.	S
	2.2 Homeostasis and interaction of trace elements Factors affecting the homeostasis of trace elements. Interaction between trace elements.	S

Section 3 Private Elementology	3.1 Macronutrients: role, metabolism, and clinical aspects Macronutrients: potassium, sodium, calcium, magnesium, phosphorus, sulfur, and chlorine. role in the body; absorption; excretion; deficiency and toxicity; associated diseases; sources.	S
	3.2 Essential Trace Elements: role, metabolism and clinical aspects Essential trace elements (iron, zinc, copper, manganese, chromium, cobalt, molybdenum, selenium, iodine): role in the body; absorption; excretion; deficiency and toxicity; associated diseases; sources.	S
	3.3 Conditionally essential trace elements: role and exchange of Conditionally essential trace elements (lithium, strontium, vanadium, nickel, tin, silicon, fluorine): role in the body; absorption; excretion; deficiency and toxicity; associated diseases; sources.	S
	3.4 Toxic and potentially toxic trace elements: role and toxicology Toxic and potentially toxic trace elements (arsenic; aluminum; lead; cadmium; mercury): role in the body; absorption; excretion; toxicity; associated diseases; sources.	S
Section 4 The role of chemical elements in dentistry	4.1 Imbalance of chemical elements in diseases: clinical manifestations Imbalances of chemical elements in various diseases of the oral cavity: caries, pulpitis, periodontitis, gingivitis, periodontitis, periodontal	S

* - filled in only for **FULL** -TIME training: *LC-lectures; LW-laboratory work; S – practical/seminar classes.*

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)
Computer lab	A computer class for conducting classes, group and individual consultations, current control and intermediate certification, equipped with personal computers (in the amount of 3 pcs.), a whiteboard (screen) and technical multimedia presentation tools.	Computer class for conducting classes, group and individual consultations, current control and intermediate certification, equipped with personal computers (in the amount of 3 pcs.), a whiteboard (screen) and technical multimedia presentation tools.

Seminar	room for conducting seminar-type classes, group and individual consultations, ongoing monitoring and intermediate certification, equipped with a set of specialized furniture and technical means for multimedia presentations.	An auditorium for conducting seminar-type classes, group and individual consultations, ongoing monitoring and intermediate certification, equipped with a set of specialized furniture and technical means for multimedia presentations.
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 the EIE.	Classroom for independent work of students (can be used for seminars and consultations), equipped with a set of specialized furniture and computers with access to the EIE.

* - the audience for independent work of students **must be specified!**

7. RESOURCES RECOMMENDED FOR COURSE STUDY

Main readings:

1. жизни :Kirichuk A. A., Gorbachev A. L., Tarmaeva I. Yu. Bioelementology as an integrative direction of life science : a monograph. - Electronic text data. - Moscow: RUDN, 2020. - 110 p.: ill. ISBN 978-5-209-10092-8.

https://lib.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=491216&idb=0

2. элементология :Skalny A.V., Skalnaya M. G., Kirichuk A. A., Tinkov A. A. Meditsinskaya elementologiya : uchebnoe posobie : dlya studentov meditsinskikh VUZov i vrachikov [Medical elementology: a textbook for students of medical universities and doctors]. - 2nd ed., ispr. and add. - Moscow : Russian University of Peoples ' Friendship, 2021. - 198, [1] p.: ill., tab., colorill.: 22 cm.; ISBN 978-5-209-10832-0.

- 3. Medical elementology: textbook / I. V. Radysh, A.V. Skalny. - Electronic text data. - Moscow: RUDN University, 2024. - 289 p.: ill. - (Golden Collection of RUDN University). - ISBN 978-5-209-11976-0 : 41.33.

https://mega.rudn.ru:443/MegaPro/UserEntry?Action=Rudn_FindDoc&id=517313&idb=0

- 4. Chemical elements in ecology, human physiology and medicine: a textbook / A.V. Skalny, A. A. Kirichuk. - Electronic text data. - Moscow: RUDN University, 2020. - 209 p.: ill. ISBN 978-5-209-10387-5 : 165.90.

https://lib.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=496075&idb=0

Additional literature:

1. Bioorganic chemistry with the basics of medicalelementology: textbook / Edited by A.V. Skalny, L. M. Shafran, and I. V. Radysh. - Moscow: RUDN University, 2019. - 628 p.: ill. ISBN: 978-5-209-08947-6

https://lib.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=501962&idb=0

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 Bioorganic chemistry for Medicine students = Биоорганическая химия для студентов-медиков : lectures / L.G. Voskressensky, A.V. Listratova, A.V. Varlamov. - Electronic text data; Book in English. - Moscow: RUDN University, 2018. - 143 p.

https://lib.rudn.ru/MegaPro/UserEntry?Action=Link_FindDoc&id=466195&idb=0

- 4 Workbook Medical Elementology Dentistry / Lobaeva T. A., Morozova G. D., Afanasyeva E. Yu., Rylyna E. V. et al. - M. Vash format, 2024. - 177 p. (ISBN 978-5-00147-665-8)

Resources of the Internet information and telecommunications network:

1. RUDN University EBS and third-party EBS that university students have access to on the basis of concluded contracts

- RUDN University Electronic Library System – RUDN University EBS

<https://mega.rudn.ru/MegaPro/Web-EBS> "University Library online"

<http://www.biblioclub.ru>- EBS Urite <http://www.biblio-online.ru>-EBS

"Student's consultant

"www.studentlibrary.ru-Znaniium EBS <https://znaniium.ru/>

2. Databases and search engines

- Sage<https://journals.sagepub.com/>

- Springer Nature Link<https://link.springer.com/>

- Wiley Journal Database<https://onlinelibrary.wiley.com/>

- Scientometric database Lens.org<https://www.lens.org>

Teaching materials for independent work of students in the development of the discipline / module:*

1. Course of lectures on the discipline "Medical elementology".

* - all teaching materials for independent work of students are placed in accordance with the current procedure on the discipline page **in TUIS!**

DEVELOPERS:

Assistant Professor

position, department

signature

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name and surname

HEAD of the Department:

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