



Educational institution  
"Royal Metropolitan University"  
Quality management system  
Syllabus of the discipline  
«Higher mathematics and computers science» of the «DNHD» EI "RMU"

**EI "ROYAL METROPOLITAN UNIVERSITY"**  
**Department of Natural and Humanitarian Disciplines**



**SYLLABUS**

Program:	General medicine
Qualification of the graduate:	General practitioner / Medical doctor
Year:	2025-2026
Semester:	2
Course duration:	18 weeks
Instructor/Assistant/Professor	Dzhumagulov E.K.
Department:	Humanities
Day and Time for consultation:	Tuesday at 11:00-13:30., room 211
Classroom:	211
e-mail:	
Course Title:	Higher mathematics and computers science
Must/Elective:	
Credit/Hours:	2

**Bishkek 2025**



**1. Name Dzhumagulov E.K.e-mail:**

**2. Description of discipline:**

To promote the mastery of medical students with the mathematical apparatus necessary for solving theoretical and practical problems, the development of students' ability to study mathematical literature independently and the ability to express natural science and clinical problems in mathematical language;

Based on the study of the basic concepts of computer science, to prepare a specialist with knowledge and skills that allow using computer applications, means of information support for medical decisions, automated medical and technological systems for solving problems of medicine and healthcare

**The place of discipline in the structure of the BEP (prerequisites, postrequisites) –**  
 The discipline " Higher mathematics and computers science " refers to the basic part of the disciplines of the humanitarian, social and economic cycle of the BEP training specialists in the direction of "Medicine". It is an ideological and scientific-methodological basis for the study of humanitarian and socio-economic disciplines.

*Prerequisites:* For successful studying of this course, student must know:

Higher math: Calculus systems, algebra, differential calculus, elementary statistics. Physics: Mechanics, basics of thermodynamics, electricity, elements of nuclear physics, optics. Anatomy.

*Post-requisites:* Biochemistry, epidemiology, normal physiology.

Learning Outcomes: (expected knowledge & ability at the end): Fundamentals of differential and integral calculus.

The theory of first-order differential equations with separable variables.

Fundamentals of statistical methods in clinical and laboratory experimental studies.

**Competencies of students, formed as a result of mastering the discipline, planned results of mastering the academic discipline.**

**1. Name and complexity of the discipline**

№	Name of discipline	course	semester	Week	Academic hours		Independent work	Total
					Lecture	Practice	IWS	
1	Higher mathematics and computers science	1	2	18	18	18	24	60

**2. Thematic plan for modules (indicating weeks and hours, dates)**

**2 semester**

Course Plan	Lecture / Practice	Topic	Date	hours
1 week	Lecture	<i>Topic 1. Elementary functions (linear, quadratic, logarithmic, trigonometric, exponential, etc.)</i>		2
2 week	Lecture	<i>Topic 2. Fundamentals of differential calculus (differential, partial derivatives, total differential, application of differentials</i>		2



		<i>in approximate calculations).</i>	
3 week	Lecture	<b>Topic 3. Fundamentals of integral calculus</b> (indefinite and definite integrals, methods of integration).	2
4 week	Lecture	<b>Topic 4. Random variables. Fundamentals of mathematical statistics</b>	2
5 week	Lecture	<b>Topic 5. Fundamentals of mathematical statistics</b>	2
6 week	Lecture	<b>Topic 6. Introduction to medical informatics. Definition of information, the information process, properties of information, and informatics.</b>	2
7 week	Lecture	<b>Topic 7. Main components of a PC. Internal and peripheral PC devices</b>	2
8 week	Lecture	<b>Topic 8. PC software. Computer service software. PC operating system.</b>	2
9 week	Lecture	<b>Topic 9.</b>	2
1 week	Practice	<b>Topic 1. Construction and study of elementary functions</b>	2
2 week	Practice	<b>Topic 2. Calculation of derivatives and application of differentials</b>	2
3 week	Practice	<b>Topic 3. Calculation of integrals and their application</b>	2
4 week	Practice	<b>Topic 4. Analysis of random variables and statistical data processing</b>	2
5 week	Practice	<b>Topic 5. Final assessment of knowledge for Unit 1</b>	2
<b>Module 1 (Date)</b>			
6 week	Practice	<b>Topic 6. Structuring a document and creating a table of contents</b>	2
7 week	Practice	<b>Topic 7. Introduction to MS Excel. Basic principles of working with a spreadsheet processor. The concept of cells with absolute and relative addresses.</b>	2
8 week	Practice	<b>Topic 8. PC software. Computer service software. PC operating system.</b>	2
9 week	Practice	<b>Topic 9. Final assessment of knowledge for Unit 2</b>	2
<b>Module 2 (Date)</b>			

### 3. Schedule of consultations

Semester	Group	Week	Time	Room
1	GM-1,2,3,4,5,6,7-25	Saturday	12.00-13.00	211

### 4. Schedule for receiving detentions

Semester	Group	Week	Time	Room
1	GM-1,2,3,4,5,6,7-25	Saturday	12.00-13.00	211



### 5. List of basic and additional literature

1. Nelkon M. Advanced Level Physics 7ed 1995
2. Nelkon M. Advanced Level Physics part 1-2 1995
3. Nelkon M. Advanced Level Physics part 3-4 1995
4. Albert Rutherford, JatH.Kim PhD The Art of Statistical Thinking 2022
5. Alexander C.Mamourian Practical MR Physics 2010
6. Neil A. Weis Introductory statistics 2019
7. Herman, Irving Physics of the Human Body 3rd edition 2014
8. Paul Davidovits Physics in Biology and Medicine, 3rd edition 2008
9. Lawrence Davis Body Physics: motion to metabolism 2020

### 6. Course policy and evaluation criteria:

The maximum score for each module is 100 points, including:

Independent Work of a Student (IWS) – 20 points

Current control (assessment) – 40 points

Module (midterm) control – 40 points

The results of all modules and the exam are combined to calculate the average course grade. Students must make up missed classes and any “unsatisfactory” grades received during the course. Makeup assignments are accepted according to the faculty duty schedule in the department.

A module control (assessment) may be retaken only for a valid reason and must be completed no later than two weeks after the module date.

A student is allowed to take the final assessment (a differentiated pass/credit or an exam) if he scores 60 or more points in the course.

A student who scores less than 60 points is not allowed to take the final assessment.

A student is exempt from taking the exam if their overall course score is between 96 and 100 (excellent). This provision does not apply to medical disciplines requiring a state final examination.

Exemption from the exam is granted by order of the rector based on a report from the dean’s office. The dean’s office prepares a semester summary report based on submissions from department heads.

### Grading System

The credit system uses a multi-point grading scale with letter grades, allowing instructors more flexibility in assessing student performance. An academic credit is considered earned if the student receives one of the following grades:

A+, A, A-, B+, B, B-, C+, C, C-, D+, D, D-. Credit is not awarded for grades outside this scale.

Scoring Policy	Module 1	Module 2, etc.
Classroom work (activity in discussions, oral questioning, working with a glossary, etc.)	40 points	40 points
Independent work: abstract, report, essay	20 points	20 points
Modular control (midterm control)	40 points	40 points
Total for the discipline:	More than 60 points	
Credit passed	The discipline is passed.	

Final assessment in the form of a pass (a credit) is carried out based on the results of the student’s independent work (SIW), current control (assessment) and midterm (modular) control for all modules.



### Assessment Policy

Form of interim assessment	Количество баллов					Mark
	Current control (max)	SIW (max)	Module (midterm) control (max)	Examination (max)	Total points (max)	
Examination	40	20	40	100	100	Excellent (Max)
Note: Method of calculating the sum of points	$M1=CK1+SIW1+MC1;$ $M2=CK2+SIW2+MC2;$				$S=(M1+M2+E)/3$	

Final assessment in the form of an exam is conducted based on the student's independent work, current control (assessments) and module (midterm) control for all modules, as well as the exam itself.

The following grade-to-point scale is used to evaluate student performance:

Rating and Scoring Scale				
Maximum score	Intervals			
	«not satisfactory»	«satisfactory»	«good»	«excellent»
20	0-11	12-15	16-17	18-20
40	0-23	24-30	31-35	36-40
60	0-35	36-45	46-53	54-60
100	0-59	60-75	76-89	90-100