

**MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION,
MINISTRY OF EDUCATION AND SCIENCE OF THE KYRGYZ REPUBLIC**

Government-run Educational Institution of Higher Professional Education
Kyrgyz-Russian Slavic University named after B. N. Yeltsin
School of Medicine



ENDORSED BY
Professor Anes Zarifyan

Physics, Mathematics

Course Outline (Module)

Assigned to the department of: **Physics, Medical Informatics and Biology**

Academic Curriculum 31050150_21_1GM.pli.xml
31.05.01. – General Medicine

Qualification **Specialist**

Mode of Study **Intramural**

The Course outline developed by: **Sadybakasov B. K.**

Course hours scheduling (per semester)

| Semester Academic Year | 2 (1.2) | | Total | |
|--|---------|------|-------|------|
| | AC | CO | AC | CO |
| Weeks | 19 | | | |
| Type of training | AC | CO | AC | CO |
| Lectures | 18 | 18 | 18 | 18 |
| Practical session | 72 | 72 | 72 | 72 |
| Contact work during the period of theoretical training | 0,3 | 0,3 | 0,3 | 0,3 |
| Including interactive session | 4 | 4 | 4 | 4 |
| Total in-class session | 90 | 90 | 90 | 90 |
| Contact work | 90,3 | 90,3 | 90,3 | 90,3 |
| Individual work | 17,7 | 17,7 | 17,7 | 17,7 |
| Total | 108 | 108 | 108 | 108 |

| 1. THE PURPOSE OF LEARNING | |
|-----------------------------------|--|
| 1.1 | Contribute to the mastery of mathematical apparatus necessary for solving theoretical and practical problems by medical students, the development of students' ability to self-study of mathematical literature and the ability to express the natural science and clinical problems by mathematical language. |
| 1.2 | To promote formation by medical students of the system knowledge about the physical properties and physical processes occurring in biological objects, including the human body, necessary for the development of other academic disciplines and the formation of professional medical qualities. |
| 1.3 | Formation by students logical thinking, the ability to accurately formulate the problem, the ability to isolate the main and secondary, the ability to draw conclusions based on the results of measurements. |

| 2. DISCIPLINE AS A PART OF THE STRUCTURE OF B.E.P. | |
|---|--|
| Cycle (section) OOI: | B1.B |
| 2.1 | Requirements for pre-training of the student: |
| 2.1.1 | School course of physics and mathematics (Know: mathematical methods of solving problems; the basic laws of physics. Be able: to state physical and mathematical laws and theorems. Skills: solve physical and mathematical problems). |
| 2.2 | Disciplines and practices for which the study of this discipline (module) is necessary as a prior: |
| 2.2.1 | Chemistry and Biochemistry |
| 2.2.2 | Normal and Pathological Physiology |
| 2.2.3 | Medical Informatics |
| 2.2.4 | Probative Medicine |
| 2.2.5 | Physiotherapy |

| 3. THE COMPETENCE OF THE LEARNER, FORMED AS A RESULT OF LEARNING (MODULE) | |
|---|--|
| BPC-7: readiness to use basic physical, chemical, mathematical and other natural science concepts and methods in solving professional problems | |
| To know: | |
| Level 1 | Basic physico-chemical, mathematical and natural science concepts and laws |
| Level 2 | Basic physico-chemical, mathematical and natural science methods |
| Level 3 | General laws of natural science for solving professional problems |
| To be able: | |
| Level 1 | Use the basic laws of natural sciences |
| Level 2 | To apply the methods of medical-biological and mathematical analysis with the use of experimental research |
| Level 3 | To analyze the results of experimental studies |
| To master: | |
| Level 1 | Methods of application of physico-chemical, mathematical and natural science laws |
| Level 2 | Methods of solving professional problems using experimental studies |
| Level 3 | Methods of analysis of the results of experimental studies |

As a result of the development of the discipline the student must:

| | |
|------------|--|
| 3.1 | To know: |
| 3.1.1 | The most common physical laws underlying the processes occurring in the body. |
| 3.1.2 | Physical properties of biological tissues and fluids. |
| 3.1.3 | Characteristics of physical factors (medical, climatic, industrial) that affect the body, biophysical mechanisms of such impact. |
| 3.1.4 | Physical characteristics of the information at the output of the medical device. Purpose and technical characteristics of the main types of medical equipment, safety when working with equipment. |
| 3.1.5 | Fundamentals of differential and integral calculus. |
| 3.1.6 | The theory of ordinary differential equations of the first order with separable variables. |
| 3.1.7 | Fundamentals of statistical methods in clinical and laboratory experimental studies. |
| 3.2 | To be able: |

| | |
|------------|---|
| 3.2.1 | Make physical measurements and statistically process of the results of measurements; extract the necessary information from the results of observations and measurements. Analyze research results in graphical and analytical form. |
| 3.2.2 | Draw up protocols of laboratory work according to the requirements; to describe the meaning of physical quantities, using physical terminology; give a verbal description of the main physical experiments. |
| 3.2.3 | Work on laboratory equipment. |
| 3.2.4 | Find derivatives and integrals; apply differentials in approximate calculations. |
| 3.2.5 | To compose and solve differential equations on the examples of problems of physical, chemical, pharmaceutical and medico-biological content. |
| 3.3 | To master: |
| 3.3.1 | Problem solving skills based on the laws of mathematics.. |
| 3.3.2 | Skills of the experiment (competently conduct the experiment; clearly represent the purpose of the study; possess various forms of illustrative expression of the results obtained in the experiment – the construction of graphs, polygons, histograms, tables). |
| 3.3.3 | Methods of statistical processing of medical and biological information. Assess the reliability of the data. |
| 3.3.4 | Methods of analysis of new scientific and educational literature, experimental results. |