

MINISTRY OF EDUCATION AND SCIENCE OF THE KYRGYZ REPUBLIC,

Government-run Educational-Institution of Higher Professional Education
Kyrgyz-Russian Slavic University
School of Medicine



Medical biophysics

Annotation of the Course (Module)

Assigned to the department of
Academic Curriculum

Physics, Medical Informatics and Biology
560001 – KR General Medicine

Qualification

Specialist

Mode of Study
Total credit value

Intramural
2 Credit points

The Course outline developed by: Manzhikova S. Ts.

Course Hours Scheduling (per semester)

| Semester Academic Year | 1(1.1) | | Total | |
|--|--------|------|-------|------|
| | Weeks | | 16 | |
| Type of Training | EP | WP | EP | WP |
| Lectures | 16 | 16 | 16 | 16 |
| Practical Session | 32 | 32 | 32 | 32 |
| Learning communication during the period of theoretical training | 0,3 | 0,3 | 0,3 | 0,3 |
| Including interactive | 4 | 4 | 4 | 4 |
| Total in class Session | 48 | 48 | 48 | 48 |
| Auditorium Learning | 48,3 | 48,3 | 48,3 | 48,3 |
| Individual work | 16 | 16 | 16 | 16 |
| Total | 64 | 64 | 64 | 64 |

| 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 formulate accurately 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) | |
|---|--|
| GSC-1: able and ready to analyze socially significant problems and processes, use the methods of natural sciences, mathematics and the humanities in various types of professional and social activities readiness to use basic physical, chemical, mathematical and other natural science concepts and methods in solving professional problems | |
| To know: | |
| Level 1 | Basic physical and chemical, mathematical and natural science concepts and laws |
| Level 2 | Basic physical and 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 and 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 physical/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 to: |
| 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. Make an analysis research results given in graphical and analytical forms. |
| 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. Data reliability assessment. |
| 3.3.4 | Methods of analysis of new scientific and educational literature, experimental results. |