



**Катедра по медицинска биология**

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## **ACADEMIC STANDARD FOR THE DISCIPLINE**

### **BIOLOGY (PHARMACY)**

#### **1. Aim**

The primary objective of education in the discipline Biology for specialty Pharmacy is the profound knowledge of the subject, assigned in the subsections: Molecular Biology, Cellular Biology, Basics of Immunology and Developmental Biology.

This objective correlates with the:

- university mission and vision;
- discipline's contents and credit rating (according to ECTS), both made apparent in the curriculum;
- qualification characteristics of the speciality;
- academic degree.

The objective is entirely consistent with the place of the discipline within the overall curriculum in terms of discipline's importance and timing in the curriculum. As a fundamental discipline, it predominantly serves the next stages of education.

#### **2. Learning**

The topics and the hours for lectures and practical exercises are posted on the website of MU-Plovdiv: <https://mu-plovdiv.bg/studenti/programi-grafitsi/uchebni-planove-programi-spetsialnosti/> Learning content is organized chronologically in such a way that each consecutive lection and related practical classes use previously studied topics and terms. Thus, unnecessary overlap between "related" disciplines is avoided.

The university's priority objectives, such as developing the students' personal qualities, encouraging their initiative, creating habits for self-education and self-learning skills, acquiring key competencies and skills, are reflected in the curriculum of the discipline, which is in agreement with the respective objectives.

### **3. Prerequisites**

The necessary knowledge and skills the student must have obtained in order to begin and successfully complete his / her tuition in Biology, include basic knowledge of biology and anatomy, which are present in the education programs in high schools. The student must build on and upgrade this knowledge throughout the course of education.

### **4. Academic resources**

The academic staff of the department includes 1 full professor and 2 associate professors, 6 assistant professors, all of which holding an educational and scientific degree "Doctor (PhD)", one is doctor of medical sciences (DMSc). Seven tutors have a specialty and 1 is enrolled and trained in the "Medical Biology" specialty at the Ministry of Health.

The lectures are given by a professor or assistant professor with a scientific degree (PhD or DSc) in the respective doctoral program. If necessary, at the discretion of the head of the department up to 30% of the lectures can be assigned to lecturers holding a PhD degree.

Practical classes are held by assistant professors with a Master's degree in medicine or biology, and are recruited after a selection exam.

### **5. Material resources**

The Department of Medical Biology at MU-Plovdiv runs 6 classrooms and 3 scientific laboratories equipped for scientific, diagnostic and experimental work. The total laboratory area of the department is 760 m<sup>2</sup>. Laboratory area assigned for the research activity of 1 lecturer is 20 m<sup>2</sup>. 4 (four) classrooms and 3 (three) scientific laboratories with a total area of 320 m<sup>2</sup> are used for teaching undergraduate and PhD students. All classrooms are provided with equipment supporting multimedia presentations. The department's laboratory facilities include general equipment (microscopes, laboratory scales, refrigerators, incubators, shakers, homogenizers, centrifuges, electrophoresis systems, trans-illuminators, pH meters, magnetic stirrers, spectrophotometers, PCR thermal cyclers, ice generators, deep freezers, etc.) and specialized scientific and diagnostic equipment (real-time PCR, fluorescence microscopes, laminar boxes, CO<sub>2</sub> incubators, ELISA readers, sequencer, Mitostress analyzer, gel-documentation systems). The department has a rich collection of durable microscopic preparations required for teaching of Biology.

### **6. Lecturing**

Lectures are prepared and given in the form of multimedia presentations, which are handed out to the students in electronic format. Lectures' content and format are chosen by the leading lecturer.

## **7. Laboratory / practical classes**

Practical classes are held separately for each group. Methodological guidelines, manuals, protocol notebooks, work protocols, reagents and consumables for the practical task are provided for every particular practical task within an exercise. Tasks can be assigned individually for each student or they may require working in groups. When students work in a group, they are usually divided into subgroups.

During the training, short tests are carried out. These tests check:

- student's knowledge
- results (obtained knowledge and skills) of the particular exercise.

## **8. Seminar exercises**

Numerous topics are given in advance for a self-study extra-auditorium work. Presentations are given by the students during practical classes. Literature recommendations on the topic to be presented are also provided. Students are usually divided into groups and each group prepares a presentation on the topic. This gives priority to teamwork and team discussions. After the presentation is given, a discussion is held by all students, with each presenter's group defending its own position on the topic.

The department organizes a public defense of scientific reviews. Candidates write essays on a given topic. The best essays are selected by a committee whose members are part of the academic staff. Selected students perform a presentation in front of the academic jury and public.

## **9. Information resources. Basic literature. Websites**

All lecturers keep developed lectures, practicals, training tests, and other course materials in the discipline, which are also available in electronic format.

A list of the main reference literature is presented, with a priority being given to the available resources that are published as "basic literature". We also recommend internet resources where appropriate materials for the student's preparation can be found.

### **Student books**

Bios instant notes. Molecular Biology by A. McLennan, A. Bates, P. Turner, M. White. 2013; 4th edition; Garland Science, Taylor & Francis Group, LLC.

Bios instant notes. Immunology by P. Lydyard, A. Whelan, M. Fanger. 2011; 3rd edition; Garland Science, Taylor & Francis Group, LLC.

Human Biology by Starr C. and McMillan B. 2014; 10th edition, BOOKS/COLE.

## **Manuals**

Practical book in medical biology for first year students in Pharmacy students. Publisher: Medical University - Plovdiv, ISBN: 978-619-237-060-2, 2020, 2022.

Feodorova Y., M. Kazakova, V. Alexandrov, N. Mehterov, V. Sarafian. Ed V. Sarafian. Tests in Medical Biology. ISBN: 978-619-7085-87-7, 2017.

## **10. Control assignments**

Students are occupied dynamically and intensively during the semester. It is assumed that the way in which knowledge and skills are acquired is an important factor in their depth, durability and applicability. Tutors should control student progress at least twice in the semester. Ongoing control can be performed through tests or control assignments. Students are provided with timely information and explanations on the control results, which assists their further preparation.

## **11. Individual work and commitment of the students**

The individual work of the students must be led by the assistant professors, who have to guide them in the literary sources, and methods for learning, as well. There are available training tests for individual work and student exercises.

## **12. Collaboration between students and the teaching staff**

This collaboration consists of:

- The teacher's commitment to the students' preparation on current difficulties in learning the subject and the opportunities with an individual learning program.
- Use of meeting hours for consultations.
- Scientific research with outstanding students.
- Including students in teams for scientific tasks, research projects, etc.

## **13. Exams**

The biology exam includes two parts – 1. WRITTEN PART (TEST) AND 2. ORAL EXAMINATION.

The written part of the exam is a stop-test, which includes 60 closed questions from the synopsis and practical exercises, each of which has only ONE correct answer, which brings 1 point. The working time is 30 minutes. Only students who have received at least 30 points on the stop test are allowed to sit for the ORAL EXAM. Students whose score is less than 30 points on the stop test are considered as failed at the biology exam and receive a grade "Poor 2".

Those who successfully pass the stop test sit for an oral exam, which is held according to a schedule on the same day. At the oral exam, each student draws 2 questions from the main modules of the biology syllabus and has 15 minutes to think and answer them in a short written form. A committee composed of a Chairperson and two assistant professors forms the final grade of the student on the basis of the knowledge demonstrated in the oral defense of the answers.

#### **14. Standards of evaluation:**

Standards for the evaluation of the students' achievements are carefully thought out, and clearly defined so that the student's assessments are objective and not depended on the lecturer.

Based on the above, clear standards for evaluation are developed as follows:

- **Excellent (6)** – for shown individual and logical thinking, additional knowledge and skills, for excellent knowledge of the subject, creativity, interpretation of the concepts, skills to solve complex tasks and right argumentation for the decisions taken, accuracy and rich language culture of the presentation.
- **Very good (5)** – for well-developed key and additional knowledge, thinking and understanding the subject, good skills to apply the knowledge, adequate use of scientific concepts from the studied field, good language culture.
- **Good (4)** – for developed additional knowledge, good knowledge of the subject; but without being able to develop learning to analysis; comparatively good language culture; but with inaccuracies in the use of different concepts and terms.
- **Satisfactory (3)** – simple reproduction and key knowledge of the subject; not ready for analysis of the knowledge gained; poor language culture with a lot of mistakes.
- **Poor (2)** – for showing scant knowledge and gross errors that cannot be the basis for the next levels of training.

At the beginning of the classes each semester the students must be informed about the evaluation standards, the procedures for conducting the ongoing control and the opportunities for obtaining a feedback on their progress during the semester.

#### **15. Final grade formation**

The final grade is obtained as a result of the final theoretical exam on the entire syllabus. In the formation of the final grade of the exam, the presentation at the oral exam is leading, but the

consistency in the preparation of the student for practical classes during the academic year is also important.

## **16. Documentation, result storage and control of the assessment procedure**

- Assessed students have the right and obligation to be informed about the assessment regulation procedures and results, and to make claims and complaints in case of violation of the current rules.
- The students' rights, in accordance with the meaning of the preceding paragraph, are guaranteed provided that technical omissions or errors have occurred (e.g. in the calculation or assessment) or that there are reasons for a vast contrast between the knowledge, skills and competencies the student have actually shown and his/her final grade.
- Corrections of the grades in cases regarding the provisions of the previous paragraph shall be made in the Student Book, the examination report or the account in the General Registry only by the leader of the discipline.
- Potential disagreements and claims on the part of the students should be directed in a written form to the assessment team, whose responsibility is to provide an argued answer by the end of the next working day.
- Revealed and proven cases of serious violation of the rights of the student in terms of assessing his / her knowledge, skills and competences are directed with a written complaint to the Vice-rector for quality and accreditation.

Exam materials are preserved and the students are given informed about them. The period during which the students have access to the examination tests and results is up to 5 working days after the announcement of the results.

This requirement shall be met in accordance with the Higher Education Act Art. 56. par. 1, " The members of the academic board shall be obliged to develop and announce in an appropriate way a description of the provided by them course of lectures, including number, titles and sequence of topics of the curriculum, recommended literature, method of evaluation of the mark and form of checking of knowledge and skills."

The academic standard for the discipline Biology for specialty Pharmacy was approved by the Departmental Council of Ministers on September 10, 2024 and published on the website of MU-Plovdiv.

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