MSc in Molecular Biology

Division of Biophysics

Subject: **BIOPHYSICS**
Year, Semester: 1st year/1st semester
Number of teaching hours:
Lecture: **28**
Seminar: **9**

Requirements

Subject: BIOPHYSICS
Year, Semester: 1st year/1st semester
Number of teaching hours:
Lecture: 28
Subject code: AO_MBE_BIF01
ECTS Credit: 3
Department: Department of Biophysics and Cell Biology, Biophysics Division
Semester recommended to take: 1st year 1st semester.
Semester fot the regular course: 1st.
Prerequisites of the course: No prerequisites.
Course coordinator: Dr. Andrea Dóczy-Bodnár
Teaching staff: Prof. Dr. Péter Nagy and the members of the Department
Educational manager: Dr. Enikő Nizsalóczki (The location and time of office hours are posted on the website.)
E-mail: biophysedu@med.unideb.hu

Aim of the course: To provide the necessary theoretical background for the understanding the physical principles applied in molecular biology, cell biology and medicine and for the description of the role of physical processes in living organisms (e.g. diffusion, electric properties of cells, etc.). Introduction to (bio)physical methods used in molecular and cell biology as well as in medicine (e.g. flow cytometry, microscopy methods, etc.)
Short description of the course: Students will be introduced to the quantitative description of the physical basis of selected topics in biology and medicine.

Structure of the course:
(1) Introduction to natural sciences (e.g. basic principles of atomic and nuclear physics)
(2) Physical principles of methods applied in molecular and cell biology (e.g. electrophoresis, sedimentation, mass spectrometry, microscopy, etc.)
(3) Medical physics (e.g. physical principles of diagnostic and therapeutic procedures)
(4) Molecular biophysics (e.g. diffusion, membrane biophysics)
(5) Organ biophysics (e.g. vision, hearing, circulation)

Compulsory reading:
(1) Educational material (lecture slides, textual explanations of lectures (“booklet”) and exercises) uploaded to the educational website (e-Learning site) of the Department;
(2) Medical Biophysics textbook (3rd revised edition, Editors: S. Damjanovich, J. Fidy, J. Szöllősi, Medicina, Budapest, 2019, ISBN: 978-963-226-127-0).

Web page of the Department: http://biophys.med.unideb.hu/en and the link to the Moodle (e-

Learning) within.

Exam: Oral exam during the exam period after the 1st semester. Students who attended the course and were granted with signature in a previous semester can take the exam in the 2nd semester as well, in the frame of the exam course (see Requirements, point 9).

Requirements

1. Lectures: Attendance to lectures is not compulsory but emphatically recommended. All material covered in lectures is an integral part of the subject, and therefore included in the self-control tests and the final exam. Some new concepts and ideas are discussed in the lectures only and are not present in the textbook.

2. Seminars: From the 6th week onwards there is a 1-hour seminar per week, where the topics of the lectures are discussed in the form of consultation. Students are encouraged to ask questions related to the topics of the lectures discussed.
Attendance to seminars is compulsory, however, a student may miss maximum 4 (four) classes. Based on demand, the seminars can be held in 3-hour blocks (two of the blocks scheduled to the weeks preceding the mid-semester SCTs (see point 5) and one block scheduled to the last week of the semester). If the seminars are held in blocks, a student may miss only one block.

3. Exemptions: In order to get exemption from the biophysics course the student has to write an application to the Educational Office. The Department of Biophysics and Cell Biology does not accept such applications.

4. Conditions for the signature: the student missed 4 or fewer classes (if there is a one-hour seminar per week) OR maximum one block (if the seminar is held in 3-hour blocks).

5. Self-control tests: There will be 2 self-control tests (SCT) during the semester. None of the SCTs are obligatory. Each SCT will be graded (0-100 %, 0% for absence) and the results of the two SCTs will be averaged (Xave). Missed SCTs cannot be made up at a later time.

Based on the written tests students may be offered the following end-semester grades:

50-59.99: pass (2)
60-69.99: satisfactory (3)
70-79.99: good (4)
80-100: excellent (5)

Only those students are eligible for the offered grade, who completed both SCTs and achieved at least 40% in each case.
Those students who achieved at least 40% in both SCTs are exempted from Part I (minimum requirement questions) of the Final Examination (see point 6).

6. Final Examination (FE): Students have three chances (A,B,C) for passing the biophysics final exam in the winter exam period after the semester in which the course was taken (or in the

summer exam period for students registered for the exam course, see point 9). Students are exempted from the FE exam if the grade offered based on the self-control tests is accepted by the student (see point 5.).
The FE consists of two parts:
Part I. Minimum requirement questions. It consists of a written quiz of 20 minimum requirement questions. One must pass this part to continue with the oral exam (part II.). Minimum requirement questions and the answers thereto are provided on the website of the Department (biophys.med.unideb.hu). 16 out of 20 have to be answered correctly in order to pass this part. This part of the FE is evaluated as pass or fail, once passed it is valid for further exam chances (B- or C-chance) of the FE.
Those students who achieved at least 40% in both SCTs are exempted from Part I of the Final Examination (see point 5).

Part II. Oral exam. Two questions chosen from the topic list (provided on the departmental website) at random should be answered. In order to complete the exam successfully students need to get pass (2) for both questions.
Those student who were offered satisfactory (3) or good (4) on the basis of their SCT results (see point 5), but did not accept the offered grade, should only answer one question in the oral exam.

7. Rules for the usage of calculators during self-control tests and the final examination: In order to ensure a fair evaluation, to avoid disturbances in the testing room, and to protect the security of the test material the following types of calculators are NOT permitted:
- calculators with built-in computer algebra systems (capable of simplifying algebraic expressions)
- pocket organizers, handheld or laptop computers
- any device capable of storing text. Calculators with a typewriter keypad (so-called QWERTY devices), electronic writing pads and pen-input devices are not allowed either. Calculators with letters on the keys (e.g. for entering hexadecimal numbers or variable names) are permitted as long as the keys are not arranged in QWERTY format.
- Calculators or other devices capable of communicating with other devices
- Calculators built into wireless phones
- Calculators with paper tape or models that make noise

In general, students may use any four-function, scientific or graphing calculator except as specified above. However, we reserve the right to prohibit the usage of ANY type of calculator, computer and data storage and retrieval device during some tests if no calculations or only very simple calculations are necessary. Sharing calculators during tests is not allowed, and the test proctor will not provide a calculator.

8. Information for repeaters
- repeating the course means attending the lectures and the seminars (see points 1 and 2);
- according to the relevant rules (point 5) self-control tests may be written and grade may be offered again;
- the results of the self-control tests written in the failed semester are lost;
- exemptions obtained in the failed semester or the exam period of the failed semester are lost.

9. Information for Exam Course students
Only those students may register for the exam course who attended the Biophysics Lecture course in a previous semester and were granted with signature. Points 1-5 and 8 are irrelevant. Point 6 and 7 applies fully. If an exemption from writing part I of the Biophysics final exam (minimum requirement questions) has been obtained based on the SCT averages, this exemption is also valid for the exam course taken in the same academic year. Every other student must write

the minimum requirement questions, even those who passed this part of the exam in a previous exam period. If a student passes the minimum requirement questions in the exam course, he/she will be exempted from taking this part again in the same exam period. The grade offered on the basis of SCT results could only be accepted in the 1semester, it cannot be used in the exam course. Exam topics: all the material covered in the semester immediately preceding the semester in which the exam course is taken.

For further information and news, check the web site of the Department (biophys.med.unideb.hu) and the link to the Moodle (e-Learning) within.