

Semmelweis University, Faculty of Medicine - undivided, one-tier training in general medicine

Name of the host institution (and any contributing institution):

Biofizikai és Sugárbiológiai Intézet

Name of subject in Hungarian: Az orvosi biofizika matematikai és fizikai alapjai

Name of subject in English: Mathematical and physical basis of medical biophysics

Name of subject in German: Grundlagen der medizinischen Biophysik

Credit value of the course: 2

Semester: 1st semester

(in which the subject is taught according to the curriculum)

Weekly hours	Lecture	Practice	Seminar
2.0	1.0	1.0	0.0

Semester hours	Lecture	Practice	Seminar
0.0	0.0	0.0	0.0

Type of course:

optional

Academic year:

2026/27

Language of instruction (for optional and elective subjects):

English

Course code:

AOVFIZ1097_1A

(in the case of a new course, to be completed by the Dean's Office, following approval)

Course coordinator name: Dr. Kellermayer Miklós (Intézet igazgató)

Course coordinator location of work, telephone availability: SE Biofizikai és Sugárbiológiai Intézet, 06-1-4591500/60200

Course coordinator position: egyetemi tanár, igazgató

Course coordinator Date and number of habilitation: 2004 PTE ÁOK 7/2004/habil

Objectives of the course, and its place in the curriculum of the medical training program:

The aim of the subject is to remedy the deficiencies in the education of mathematics and physics in secondary schools, and to provide the background knowledge necessary for the Biophysics subject.

Format of the course (lectures, group work, practical lessons, etc.):

lecture + practical lesson

Competencies acquired through completion of course:

The brief summary of secondary school physics necessary for understanding of biophysics

Course outcome (names and NEPTUN ID of related subjects):**Prerequisites for course registration and completion: (NEPTUN ID):**

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In the case of multi-semester courses, position on the possibility of and conditions for concurrent registration:

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The number of students required to start the course (minimum, maximum), method of selecting participants:

Maximum 320 students

**Detailed course syllabus (if the course can be divided into modules, please indicate):
(Theoretical and practical instruction must be broken down into hours (weeks), numbered separately; names of instructors and lecturers must be listed, indicating guest lecturers/instructors. It cannot be attached separately! For guest lecturers, attachment of CV is required in all cases!)**

14 hours lecture 3 14 hours practice in the first eight weeks of the semester.

1. Mathematics, necessary for the understanding of biophysical laws
2. Physical quantities and units
3. Kinematics - motions
4. Statics - changes of shape, forces, mechanical stress, pressure
5. Dynamics - work, energy
6. Oscillations, waves
7. Fluid mechanics
8. Thermodynamics
9. Electricity - charges in rest and in motion

10. Magnetism, magnetic induction

Lecturers: Dr. Gergely Agócs, Dr. Dóra Haluszka, Dr. Zsolt Mártonfalvi, Dr. Gusztáv Schay

Other courses with overlapping topics (obligatory, optional, or elective courses) in interdisciplinary areas. To minimize overlaps, topics should be coordinated. NEPTUN ID(s) of courses (to be provided):

Requirements for attendance, options for making up missed sessions, and method of absence justification:

On the practical lessons 75 % attendance is required

Assessment methods during semester (number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks):

(number, topics, and dates of midterms and reports, method of inclusion in the course grade, opportunities for make-up and improvement of marks)

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Number and type of individual assignments to be completed, submission deadlines:

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Requirements for the successful completion of the course:

75 % attendance on the practical lessons

Type of assessment:

term grade

Exam requirements (list of topics, topics of the test exam, and the optional project topics accepted as an exam)

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Clear, specific minimum requirements for assessment. (The list of mandatory concepts, parameters, diagrams, calculations, and practical skills required to obtain a passing grade,

as well as the criteria for the completion and evaluation of project assignments accepted as an exam.) A link published on the department's website referring to the minimum requirements of the course.

The minimum requirement is that the weighted mean of the test questions (defined in paragraph 29.) reaches 50%. The weights of the individual questions will be made available along with the tests' questions on the course's Moodle page.

Method and type of grading (Share of theoretical and practical examinations in the overall evaluation. Inclusion of the results in the end-of-term assessment. Possibilities of and conditions for offered grades.): (Share of theoretical and practical examinations in the overall evaluation, Inclusion of the results in the end-of-term assessment, Possibilities of and conditions for offered grades)

The grade is based on the result of test written on the 9th week.

Artificial intelligence systems used in the teaching of the subject and the manner of their application

List of coursebooks, textbooks, study aids and literature facilitating the acquisition of knowledge to complete the course and included in the assessment, precisely indicating which requirement each item is related to (e.g., topic by topic) as well as a list of important technical and other applicable study aids; possibility of individual or group student consultation, if available:

Online resources:

Type	Recommended
Title	
Link	biofiz.semmelweis.hu

Signature of habilitated instructor (course coordinator) announcing the course:

Signature of the director of the host institution:

Date of submission:
