1.1. Course description

<table>
<tr><td>NAME OF THE COURSE</td><td colspan="5">Laboratory Course in Biophysics</td></tr>
<tr><td>Code</td><td></td><td>Year of study</td><td colspan="3">1 D</td></tr>
<tr><td>Course teacher</td><td>Damir Kovačić
Larisa Zoranić</td><td>Credits (ECTS)</td><td colspan="3">4</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>P</td><td>S</td><td>V</td><td>T</td></tr>
<tr><td></td><td></td><td>40</td><td></td></tr>
<tr><td>Status of the course</td><td>Obligatory</td><td>Percentage of application of e-learning</td><td colspan="3"></td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="5">The aim of the course is to introduce students to the biophysical, medical and biological methods of measurements and data analysis.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">The learning outcomes of Bachelor programmes in physics, basic knowledge in molecular biology and biochemistry</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">After completing the course, students will be able to:
do basic analysis of the morphology of neuronal cultures (density, directionality, velocity of growth)
use numerical programs for the analysis of morphology
measure and determine the concentration of peptides
measure and define the influence of peptides on the prokaryotic and eukaryotic cells
do basic experiments on bacterial cultures
understand basic atomic force microscopy (AFM) principles
analyse AFM image with Gwyddion</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">1. Morphological analysis of neuronal cultures
Theoretical introduction - in vitro cultivation of neuronal cultures (4h)
Image processing neuronal cultures of the software package ImageJ - remove the background, improve visual contrast, preparations for the Oval FFT (2h)
Determination of the density and orientation of neuronal cultures (spiral and spinal ganglia) (4h)
2. Antimicrobial peptides- measuring concentration and activity
Theoretical background – design and definition of biophysical characteristics by means of "on-line" tools. -(4h)
Measure concentration of peptides by spectophotometry - (2h)
Measuring the inhibitory concentration of AMP - (2h)
Measuring hemolytic activity - (2h)
3 Electron microscopy
Principles of work of electron microscope - (2h)
Sample preparation. Measurements - (6h)
Data analysis - (2h)
4. Atomic force microscopy (AFM)
Principles and modes of AFM imaging - (2h)</td></tr>
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	• Cell preparation for AFM imaging. Cell imaging. - (6h) • Data analysis in Gwyddion software. - (2h)
Format of instruction	Laboratory experiments with an active participation of students and with professional guidance.
Student responsibilities	Student responsibilities are: to attend classes, to prepare and perform experiments, to write and presents reports.
Screening student work *(name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)*	Classes – 1.5 Exams - 0.25 Written reports - 1.25 Final exam – 1
Grading and evaluating student work in class and at the final exam	During each term, the student's knowledge of the experiment is verified, while on each performed experiment students must write a report that will be evaluated. The final score is based on the knowledge shown during classes and exam,s and the written reports on conducted experiments.
Required literature (available in the library and via other media)	
Optional literature (at the time of submission of study programme proposal)	
Quality assurance methods that ensure the acquisition of exit competences	1. Analysis of the acquired learning outcomes at the end of the class, compared with the introductory work of students. 2. Monitoring the development of students in the subjects who followed the links with the success of the case 3. Other surveys of students
Other (as the proposer wishes to add)	