<table>
<tr><td colspan="2">NAME OF THE COURSE</td><td colspan="5">Bioinformatics basics</td></tr>
<tr><td>Code</td><td>PMC224</td><td>Year of study</td><td colspan="4">2</td></tr>
<tr><td>Course teacher</td><td>Stjepan Orhanović, Ph.D.
Associate Professor</td><td>Credits (ECTS)</td><td colspan="4">3,0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>15</td><td>15</td><td>15</td><td></td></tr>
<tr><td>Status of the course</td><td>mandatory</td><td>Percentage of application of e-learning</td><td colspan="4">30%</td></tr>
<tr><td colspan="7">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="6">The aim of the Bioinformatics course is to familiarize students with data (sequences and structural information) generated by experimental work in the fields of biochemistry and molecular biology, their storage in databases and the possibilities of processing this data with bioinformatics tools</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="6">Biochemistry I course taken, basic knowledge of the structure and sequence of DNA and proteins is required.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="6">After passing the exam, the student will be able to:
Search relevant databases: scientific publications, sequences of nucleic acids and proteins and the structure of biological macromolecules
Analyze DNA, RNA and protein sequences
Analyze protein structure
Identify the role and potentials of bioinformatics in the development of medicines
Identify ways of genome analysis and analysis of gene sequence, phenotype and inherited diseases</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="6">Lectures in bioinformatics will be followed by exercises in the IT classroom after which students will present their seminar papers. 30% of classes will be prepared as e-learning using online sources.
1. Scientific literature and basics of searching scientific publications (1 hour of lectures and 1 hour of exercise,)
2. Databases of nucleic acid sequences (1 hour lecture and 1 hour of exercise)
3. Protein sequence databases (1 hour lecture and 1 hour of exercise)
4. Alignment of sequences and phylogenetic trees (1 hour lecture and 1 hour of exercise, 1 hour of seminar)
5. Seminar, search and analysis of scientific publications and sequences I (2 hours)
6. Seminar, search and analysis of scientific publications and sequences II (2 hours)
7. Protein structure databases I (1 hour lecture and 1 hour of exercise)
8. Protein Structure Databases II (1 hour lecture and 1 hour of exercise)
9. Seminar, analysis of protein structures (2 hours)
10. Databases of sequenced genomes (1 hour lecture and 1 hour of exercise)
11. Seminar sequences and genome analysis (2 hours)
12. Structural bioinformatics and drug discovery (1 hour lecture and 1 hour of exercise)
13. Getting acquainted with DNA microarray data and using mass spectrometry in protein sequencing I (1 hour lecture and 1 hour of exercise)
14. Getting acquainted with DNA microarray data and using mass spectrometry in protein sequencing II (1 hour lecture and 1 hour of exercise)</td></tr>
<tr><td>Format of instruction</td><td colspan="3">☒ lectures
☒ seminars and workshops
☒ exercises
☐ on line in entirety
☒ partial e-learning
☐ field work</td><td colspan="3">☒ independent assignments
☐ multimedia
☐ laboratory
☐ work with mentor
☐ (other)</td></tr>
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Student responsibilities						
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)*	Class attendance	1.5	Research		Practical training	
	Experimental work		Report		Exam preparation	0.7
	Essay		Seminar essay	0.7	(Other)	
	Tests		Oral exam		(Other)	
	Written exam	0.1	Project		(Other)	
Grading and evaluating student work in class and at the final exam	Students take a written exam, for a passing grade it is necessary to solve 50% of the exam. Seminar papers are evaluated comprising an overall score of 50%, the other 50% is the grade of the written part of the exam.					

Required literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	2. Arthur M. Lesk, Introduction to bioinformatics 3e, 3. Oxford University Press, 2008	1	

Optional literature (at the time of submission of study programme proposal)	David W. Mount, Bioinformatics, Sequence and Genome analysis, 2e, Cold Spring Harbor Laboratory Press, 2004 Jonathan Pevsner, Bioinformatics and Functional Genomics, John Wiley and Sons, 2009
Quality assurance methods that ensure the acquisition of exit competences	Personal consultations, students survey for the evaluation of the subject and teacher, evidence of the presence on the classes, analysis of the success rate on the partial and final tests.
Other (as the proposer wishes to add)	