<table>
<tr><td>COURSE NAME</td><td colspan="5">Graph theory</td></tr>
<tr><td>Code</td><td>PMM806</td><td>Year of study</td><td colspan="3">3rd year of undergraduate study</td></tr>
<tr><td>Course teacher</td><td>Damir Vukičević
Tanja Vojković</td><td>Credits (ECTS)</td><td colspan="3">5</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></tr>
<tr><td>30</td><td></td><td>30</td></tr>
<tr><td>Status of the course</td><td>Obligatory course</td><td>Percentage of application of e-learning</td><td colspan="3">30%</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 basic topics and methods of graph theory.
Students will learn to understand properties of graphs, and their importance in applications.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Entry competences: Students should be familiar with basic concepts of linear algebra.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">Students will be able to :
• correctly formulate theorems and definitions of important concepts,
• illustrate the concepts and conclusions with adequate examples,
• construct mathematical proofs,
• model and solve problems using graph theory,
• apply the obtained knowledge and skills to investigate and solve a variety of graph theory problems,
• clearly and unambiguously communicate their arguments and conclusions to both laics and experts
• have the learning skills which enable lifelong education in this field</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">1. Introduction. Graphs and drawings of graphs. Basic concepts of graph theory. Examples of different graph types. (3)
2. Bipartite graphs. Graph isomorphisms. (2)
3. Connectivity in graphs, walks and paths. (3)
4. Euler and Hamiltonian graphs. (3)
5. Trees, characterization and properties, counting trees. (3)
6. Graph colorings, vertex and edge colorings, chromatic number (4)
7. Planar graphs, Euler’s theorem, colorings of planar graphs. (3)
8. Directed and weighted graphs. (3)
9. Vertex and edge connectivity. (2)
10. Pairings in graphs, vertex and edge covers, perfect and maximal matchings. (4)</td></tr>
<tr><td>Format of instruction</td><td colspan="5">Lectures and tutorial sessions.</td></tr>
<tr><td>Student responsibilities</td><td colspan="5">Class attendance. Students are expected to be present at least 70% of classes.</td></tr>
<tr><td>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)</td><td colspan="5">Class attendance: 3 ECTS.

Partial exams/Written exam: 1 ECTS

Final exam: 1 ECTS.</td></tr>
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Grading and evaluating student work in class and at the final exam	Two partial written exams / one final written exam and final oral exam. There are 2 partial written exams during the semester. Passing the both partial exams or the final written exam allows students to take the oral exam. Successfully passing the oral exam leads to a successful completion of the course.
Required literature (available in the library and via other media)	A. Golemac, Osnove teorije grafova, skripta, PMF, Split, 2014. D. Veljan, Kombinatorna i diskretna matematika, Algoritam, Zagreb, 2001. D. Veljan, Kombinatorika s teorijom grafova, Školska knjiga, Zagreb, 1989. M. Cvitković, Kombinatorika, zbirka zadataka, Element, Zagreb, 1994.
Optional literature (at the time of submission of study program proposal)	Matoušek, J. Nešetril, Invitation to Discrete Mathematics, Oxford University Press, Oxford, 1998. R.J. Wilson, Introduction to Graph Theory, Longman, Harlow, Essex, 1999.
Quality assurance methods that ensure the acquisition of exit competences	Anonymous student evaluations according to the regulations of the University of Split and summarizing test results.
Other (as the proposer wishes to add)	