<table>
<tr><td>COURSE NAME</td><td colspan="5">Ordinary differential equations</td></tr>
<tr><td>Code</td><td>PMM103</td><td>Year of study</td><td colspan="3">3rd year of undergraduate study</td></tr>
<tr><td>Course teacher</td><td>Izv.prof.dr.sc. Nikola Koceić Bilan</td><td>Credits (ECTS)</td><td colspan="3">6 ECTS</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>Compulsory</td><td>Percentage of application of e-learning</td><td colspan="3">40%</td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="5">Introduce students to basic ideas of ordinary differential equations. Assure understanding of basic models. Demonstrate theorems of existence and uniqueness of solution as well as some of the commonly used techniques for finding solutions with emphasis on the theory of linear equations.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Differential and Integral Calculus I</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 are expected to:
1. identify real-life problems which can be modeled by differential equations;
2. explain in their own words conditions that ensures existence and uniqueness of a solution of the Cauchy problem;
3. distinguish characteristic properties of linear equations and systems from nonlinear ones;
4. select and apply appropriate methods to solve basic differential equations;
5. identify and apply initial and boundary values to find particular solution.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">1. Introduction: Definitions and Terminology. Differential Equations as Mathematical Models (1 week)
2. First Order Ordinary Differential Equations: Existence and Uniqueness of Solution. Different types of First Order Equations (including ODE with separable variables, homogeneous, Bernoulli, exact) Applications. (4 weeks)
3. Higher Order Differential Equations: Reduction of Order. Homogeneous Linear Equations with Constant Coefficient. Nonhomogeneous Equations (Undetermined Coefficients, Variation of Parameters). Laplace Transform Methods (5 weeks)
4. Linear System of First Order Differential Equations: Preliminary Theory. The eigenvalue method for homogeneous systems. Variation of Parameters (3 weeks)
5. Orthogonal Functions: Orthogonal Functions. Sturm-Liouville Problem. Examples. (2 weeks)</td></tr>
<tr><td>Format of instruction</td><td colspan="5">Lecture and exercises.</td></tr>
<tr><td>Student responsibilities</td><td colspan="5">Attend class regularly and take notes. Take exams when scheduled.</td></tr>
<tr><td>Screening student work (name the proportion of ECTS</td><td colspan="5">Attending class: 2 ECTS
Written exam: 2 ECTS
Oral exam: 2 ECTS</td></tr>
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credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)	
Grading and evaluating student work in class and at the final exam	The final exam consists of a written and an oral part. Successful written exam is required for taking the oral exam. Acceptable results achieved in midterm exams taken during the semester replace the written part of the exam.
Required literature (available in the library and via other media)	D.G. Zill and M.R. Cullen, *Differential Equations with Boundary-Value Problems*, Brooks/Cole, Cengage 2009.
Optional literature (at the time of submission of study programme proposal)	1. W.E. Boyce and R.C. DiPrima, *Elementary Differential Equations and Boundary Value Problems*, John Wiley & Sons, Inc., New York, 2012. 2. M. Alić, *Obične diferencijalne jednadžbe*, skripta, PMF-Zagreb, Matematički odjel, 1994.
Quality assurance methods that ensure the acquisition of exit competences	Statistics of test results and student evaluation via anonymous questionnaires at the end of the course. The survey is conducted according to the rules of the University of Split.
Other (as the proposer wishes to add)	