<table>
<tr><td>COURSE NAME</td><td colspan="7">Partial Differential Equations</td></tr>
<tr><td>Code</td><td>PMM915</td><td>Year of study</td><td colspan="5">1st year of graduate study,
2nd year of graduate study</td></tr>
<tr><td>Course teacher</td><td>Saša Krešić Jurić</td><td>Credits (ECTS)</td><td colspan="5">6,0</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></td></tr>
<tr><td>30</td><td></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>compulsory, elective</td><td>Percentage of application of e-learning</td><td colspan="5"></td></tr>
<tr><td colspan="8">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="7">The course objective is to introduce students to the theory of partial differential equations (PDE) and to teach them basic techniques for finding their solutions. The emphasis is on understanding the theoretical results as well as developing practical skills for problem solving.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="7">Prerequisites: completed courses Differential and Integral Calculus 1 and 2 (or Mathematics 1 and 2), Linear Algebra (or Linear Algebra and Matrix Calculus) and Ordinary Differential Equations (or Differential Equations)

Required competences: knowledge of differential and integral calculus in one and two varibles, matrix calculus and ordinary differential equations</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="7">It is expected that the student will be able to:

1. find Fourier series of a given function,
2. classify second order linear PDEs in two variables,
3. formulate stability problems of PDEs for different types of inital and boundary conditions,
4. find solutions of the heat equation and wave equation by the method of separation of variables,
5. find D'Alambert's solution of the wave equation,
6. find solutions of the Laplace and Poisson equations by the method of separation of varibles for rectangular and circular domains.

It is also expected that the student is able to prove the theorems used in the development of the theory of PDEs.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="7">1. Introduction and elementary techniques (2 hours)
2. Initial and boundary conditions, stability of solutions (2 hours)
3. Fourier series (2 hours)
4. Dirichlet's theorem, uniform convergence (2 hours)
5. Classification of second order equatins (2 hours)
6. Canonical forms of hyperbolic, parabolic and elliptic equations (2 hours)
7. The maximum principle for the heat equation, the uniqueness theorem (2 hours)
8. Separation of variables for the heat equations, existence of solutions (4 hours)
9. D'Alambert's solution of the wave equation (2 hours)
10. Separation of variables for the wave equation, existence of solutions (4 hours)
11. The maximum principle and the mean value principle for harmonic functions (2 hours)
12. Separation of varibles for the Laplace equation for rectangular and circular domains, existence and uniques of solutions (3 hours)
13. Poisson formula (1 hour)</td></tr>
<tr><td>Format of instruction</td><td colspan="7">Lectures and tutorial sessions.</td></tr>
</table>

Student responsibilities	Class attendance and partial written exams.
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 hours Partial written exams: 2 hour Final exam: 3 hours
Grading and evaluating student work in class and at the final exam	Partial written exams and final written and oral exam. Positive grade of the written exam is required to take the oral exam.
Required literature (available in the library and via other media)	Y. Pinchover, J. Rubinstein, *An Introduction to Partial Differential Equations*, Cambridge University Press, 2007.
Optional literature (at the time of submission of study programme proposal)	D. Bleeker, G. Csordas, *Basic Partial Differential Equations*, Van Nostrand Reinhold, New York, 1992. T. Myint-U, L. Debnath*, Linear Partial Differential Equations for Scientists and Engineers*, 4th ed., Birkhauser, Boston, 2007.
Quality assurance methods that ensure the acquisition of exit competences	Anonymous student evaluations at the end of semester according to the regulations of the University of Split.
Other (as the proposer wishes to add)	