<table>
<tr><td>COURSE TITLE</td><td colspan="5">USING TECHNOLOGY IN MATH TEACHING</td></tr>
<tr><td>Code</td><td>PMM917</td><td>Year of study</td><td colspan="4">Graduate study, 1st and 2nd year</td></tr>
<tr><td>Lecturer(s)</td><td>Željka Zorić</td><td>ECTS credits</td><td colspan="4">3</td></tr>
<tr><td rowspan="2">Assistants</td><td rowspan="2"></td><td rowspan="2">Teaching methods (hours per semester)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>0</td><td>30</td><td>0</td><td>0</td></tr>
<tr><td>Course status</td><td>Compulsory and elective course</td><td>e-learning %</td><td colspan="4"></td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="5">• educate students on methodology of using ICT in the educational process, their own development and research</td></tr>
<tr><td>Course prerequisites for enrolment and competency requirements</td><td colspan="5">No prerequisites for the course.</td></tr>
<tr><td>Expected learning outcomes on course level (4-10 learning outcomes)</td><td colspan="5">After finishing the course, students should be able to:
• independently design lesson in which ICT will be applied
• independently write a lesson plan with the use of ICT
• independently create teaching resources by applying ICT
• select and apply appropriate ICT in order to improve the efficiency of teaching and learning
• independently design, prepare and create methodically designed educational content in whose processing is used ICT
• teach a lessons with the use of ICT according to the modern methodological concepts
• responsibly, morally and safely use of ICT
• effectively communicate and collaborate in a digital environment</td></tr>
<tr><td>Detailed course content according to teaching hours</td><td colspan="5">The subject is conceptually divided into two parts. The first part deals with theoretical and methodological concepts of ICT in teaching mathematics with a review of the existing teaching materials and aids intended for this purpose. The second part of the course is designed to use existing models, research and solving concrete problems by using ICT. In second part students will create their own methodically designed educational content in whose processing is used ICT.
1. The use of ICT in teaching. The function and methods of application of ICT in teaching mathematics. How to organize math class with application of ICT considering to the available equipment?
2. Methodical and educational principles and rules of application of ICT in math teaching. Planning and creating lessons with the use of ICT. Teaching techniques suitable for the application of ICT.
3. Types of software tools suitable for use in math education and their features: general tools (spreadsheets, presentation tools, text processing), graphing calculators, mathematical tools (dynamic geometry, CAS), multimedia tools. Advanced use of ICT in teaching mathematics (digital textbooks, e-learning).
4. Use of ICT in interpretation of particular teaching content:
4.1. Numbers</td></tr>
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<tr><td></td><td colspan="6">4.2. Algebra and Functions
4.3. Geometry
4.4. Data analysis, statistics
4.5. Moulding
4.6. Research and experimentation
4.7. Connecting with other subjects</td></tr>
<tr><td>Types of teaching methods</td><td colspan="3">☐ lectures
☒ seminars and workshops
☐ exercises
☐ entirely online
☐ e-learning, combination
☐ field work</td><td colspan="3">☒ individual tasks
multimedia
☐ laboratory
☒ mentorship
☐ (fill in)</td></tr>
<tr><td>Student obligations</td><td colspan="6">• regular attendance
• write a seminar report on selected topic
• submit a written report
• present a report
• actively participate in the classes
• score certain number of points in all independent tasks
• pass preliminary exams</td></tr>
<tr><td rowspan="5">Monitoring students practice (enter ECTS credits for each activity so that total ECTS credits correspond to subject scores)</td><td>Attendance</td><td>1</td><td>Research</td><td></td><td>Praxis</td><td></td></tr>
<tr><td>Experiments</td><td></td><td>Paper</td><td></td><td>Individual tasks</td><td>0.8</td></tr>
<tr><td>Essays</td><td></td><td>Report</td><td>0.6</td><td>(fill in)</td><td></td></tr>
<tr><td>Preliminary exam</td><td>0.6</td><td>Oral exam</td><td></td><td>(fill in)</td><td></td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(fill in)</td><td></td></tr>
<tr><td>Evaluation and assessment of student performance in the course and on the final exam</td><td colspan="6">Students who were regular in attending classes (over 90%), who wrote and presented a seminar paper and got a passing grade, have the right to obtain the signature.

Students with the right to the signature have their grade formed according to the points obtain in class, at preliminary exams and report,
Preliminary exams
During the semester, there will be two exams, which carry 40% of the total grade. Each of the preliminary exams carries maximum of 20 points. For passing student must have at least 10 points.
Seminar (report)
Seminar consists of a written part, report and presentations and carries 30% of the total grade (written part carries maximum 10 points, report 5 points and presentation 15 points).
Individual tasks
During course, students will receive 6 individual assignments which are assessed with maximum 5 points. The total share of individual tasks in the final grade is 30%, in other words they carry 30 points.
The final grade is obtained by summing the assessment points obtained through the planned activities. For passing the course student must have a minimum of 50</td></tr>
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<tr><td></td><td colspan="3">points, of which at least 20 points in the preliminary exams.</td></tr>
<tr><td rowspan="6">Obligatory literature (available in the library or through other media)</td><td>Title</td><td>Number of copies in the library</td><td>Availability through other media</td></tr>
<tr><td>A. Oldknow, R. Taylor, L. Tetlow, Teaching mathematics using ICT, Continuum, London, 2010.</td><td></td><td></td></tr>
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<tr><td></td><td></td><td></td></tr>
<tr><td>Additional literature</td><td colspan="3">A. Oldknow, C. Knights, Mathematics education with digital technology, Continuum, London, 2011.
M. Serra, Discovering geometry: An investigative approach, Key Curriculum Press, 2008.
J. Murdock, E. Kamischke, E. Kamischke, Discovering Algebra: An investigative approach, Key Curriculum Press, 2007.
G.A.Jones, Exploring probability in school: Challenges for teaching and learning, Springer, 2005
Williams, Easingwood, ICT and primary mathematics, RoutledgeFalmer, 2004.
Way, Beardon, ICT and primary mathematics, Open University Press, 2003.
Original manuals and other didactic materials for specific software products and graphic calculators</td></tr>
<tr><td>Quality monitoring methods that enable the achievement of course objectives</td><td colspan="3">During the last week of the course in an anonymous survey students will evaluate the quality of the classes</td></tr>
<tr><td>Other (in the opinion of the proposer)</td><td colspan="3"></td></tr>
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