<table>
<tr><td>COURSE NAME</td><td colspan="5">Introduction to Algebra with Analytic Geometry</td></tr>
<tr><td>Code</td><td>PMM712</td><td>Year of study</td><td colspan="4">1st year of undergraduate study</td></tr>
<tr><td>Course teacher</td><td>Gordan Radobolja</td><td>Credits (ECTS)</td><td colspan="4">8</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>45</td><td></td><td>45</td><td></td></tr>
<tr><td>Status of the course</td><td>Compulsory course</td><td>Percentage of application of e-learning</td><td colspan="4">15%</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 knowledge and skills in classical algebra of vectors and analytic geometry and different coordinate systems. Students will adopt an elementary knowledge in basic algebraic structures and vector spaces and prepare for more advanced abstract notions such as linear operator, affine space etc.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Prerequisites: none
Entry competences: Knowledge of secondary school mathematics</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:
- formulate the theorems and definitions of classic algebra of vectors, analytic geometry, and elementary algebraic structures,
- present in a clear manner correct mathematical reasoning and proofs,
- distinguish and give examples of elementary algebraic structures,
- demonstrate understanding of the concepts of vector space and subspace,
- solve problems within the course content.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">Introduction – coordinate systems (2)
• Cartesian coordinate system on plane and in space.

Classical algebra of vectors. (11)
• Oriented lines and radius vectors. Operations with radius vectors and coordinatization. (4)
• Vectors. Collinearity and coplanarity of vectors. Basis and dimension. Coordinatization. (4)
• Inner product. Orthonormal basis. Coordinatization of inner product. Cross product. Triple scalar product. (3)

Elements of analytic geometry in E^3. (13)
• Plane equations. Distance between a point and a plane. Angle between planes. (4)
• Analytic line presentations. Angle between lines and planes. Distances between line and a point or a plane. Common normal and distance of two lines. (3)
• Second-order planar curves. Quadric surfaces. (3)
• Polar cylindrical and spherical coordinates. (3)

Algebraic structures. (9)</td></tr>
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	• Binary operations. Groupoid, semigroup, monoid, group - definitions, examples, basic properties (3) • Cyclic groups and permutations groups. (3) • Group homomorphisms - definition and examples. (1) • Ring - definition and examples, basic properties. (1) • Division ring and Field. (1) Linear spaces. (10) • Definitions and examples. (2) • Linear independence. Basis and dimension. (4) • Subspaces, intersection and sum. Quotient space. (4)
Format of instruction	Lectures and tutorial sessions.
Student responsibilities	Class attendance. Students are expected to be present at least 70% of classes.
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: 4 ECTS. Partial exams or written exam: 2 ECTS Final exam: 2 ECTS.
Grading and evaluating student work in class and at the final exam	There are 2 partial written exams during the semester and the final exam. 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)	K. Horvatić, Linearna algebra I i II, PMF – Matematički odjel, HMD, Zagreb, 1995. N. Elezović, A. Aglić, Linearna algebra, Element, Zagreb, 1999. N. Bakić, A. Milas, Zbirka zadataka iz linearne algebre s rješenjima, PMF–Matematički odjel, HMD, Zagreb, 1995. N. Elezović, A. Aglić, Linearna algebra, Zbirka zadataka, Element, Zagreb, 1999.
Optional literature (at the time of submission of study programme proposal)	B. Pavković, D. Veljan, Elementarna matematika 2, Školska knjiga, Zagreb, 1994. S. Kurepa, Konačnodimenzionalni vektorski prostori i primjene, Liber, Zagreb 1992.
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)	