

UČNI NAČRT PREDMETA / COURSE SYLLABUS						
Predmet:	Linearna algebra					
Course title:	Linear algebra					
Študijski program in stopnja Study programme and level	Študijska smer Study field			Letnik Academic year	Semester Semester	
Razvoj videoiger in razširjenih resničnosti, visokošolski strokovni študijski program prve stopnje	-			Drugi	Tretji	
Game and Extended Reality Development, first cycle Professional Study Programme	-			Second	Third	
Vrsta predmeta / Course type			Obvezni / Obligatory			
Univerzitetna koda predmeta / University course code:			4-RVRR-VS-LA-2025-02-27			
Predavanja Lectures	Seminar Seminar	Vaje Tutorials	Klinične vaje work	Druge oblike študija	Samost. delo Individ. work	ECTS
30	-	45	-	-	105	6
Nosilec predmeta / Lecturer:			Izr. prof. dr. Borut Lužar			
Jeziki / Languages:	Predavanja / Lectures:		Slovenski, angleški / Slovene, English			
	Vaje / Tutorials:		Slovenski, angleški / Slovene, English			
Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:			Prerequisites:			
Pogoj za vključitev v delo je opravljen izpit iz Matematike 1.			To enrol in the course, it is necessary to pass Mathematics 1.			
Vsebina:			Content (syllabus outline):			
<ul style="list-style-type: none"> • Vektorji • Matrike • Determinante • Reševanje sistemov linearnih enačb • Lastne vrednosti in lastni vektorji • Vektorski prostori • Baze • Linearne transformacije • Ortogonalnost in ortogonalne linearne transformacije • Vrtenja evklidskega prostora 			<ul style="list-style-type: none"> • Vectors • Matrices • Determinants • Solving systems of linear equations • Eigenvalues and eigenvectors • Vector spaces • Bases • Linear transformations • Orthogonality and orthogonal linear transformations • Rotations of Euclid space 			

<ul style="list-style-type: none"> • Osnove projektivne geometrije 	<ul style="list-style-type: none"> • Basics of projective geometry
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Temeljni literatura in viri / Readings:

- J. Graselli, A. Vadnal (2003). Linearna algebra, linearno programiranje. Matematika-fizika, zbirka univerzitetnih učbenikov in monografij.
- P. Moravec (2024). Linearna algebra. Fakulteta za matematiko in fiziko, Univerza v Ljubljani.
- G. Strang (2016). Introduction to Linear algebra. Wellesley-Cambridge Press.

Cilji in kompetence:

Učna enota prispeva k razvoju naslednjih splošnih in predmetno-specifičnih kompetenc:

Splošne kompetence:

- Sposobnost analitičnega in algoritmičnega razmišljanja.
- Sposobnost fleksibilne uporabe znanja v praksi.

Predmetno-specifične kompetence:

- Sposobnost reševanja problemov z uporabo linearne algebre.
- Sposobnost povezovanja konceptov linearne algebre z drugimi področji.
- Sposobnost uporabe linearne algebre pri modeliranju gibanja 3-dimenzionalnih teles.
- Poznavanje osnov projektivne geometrije.

Objectives and competences:

The instructional unit contributes to the development of the following general and subject-specific competences:

General competences:

- Ability of analytical and algorithmic thinking.
- The ability of flexible usage of knowledge in practice.

Subject-specific competences:

- Ability to solve problems using linear algebra.
- Ability to link concepts of linear algebra with other areas.
- Ability to apply linear algebra in modelling movements of 3-dimensional objects.
- Knowledge of projective geometry basics.

Predvideni študijski rezultati:

Znanje in razumevanje:

- študent bo spoznal napredne pojme in principe linearne algebre,
- študent bo sposoben prepoznati praktične probleme in jih reševati z

Intended learning outcomes:

Knowledge and understanding:

- the student will get acquainted with advanced notions and principles of linear algebra,
- the student will be able to recognize

<p>orodji linearne algebre,</p> <ul style="list-style-type: none"> • študent bo spoznal osnove projektivne geometrije. <p>Prenosljive/ključne spretnosti in drugi atributi:</p> <ul style="list-style-type: none"> • pridobljeno znanje se primarno lahko uporabi pri prostorskem umeščanju in animiranju objektov. 	<p>practical problems and solve them with linear algebra tools,</p> <ul style="list-style-type: none"> • the student will get acquainted with basics of projective geometry. <p>Transferable/key skills and other attributes:</p> <ul style="list-style-type: none"> • acquired knowledge can be primarily applied in spatial positioning and animation of objects.
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Metode poučevanja in učenja:

<ul style="list-style-type: none"> • predavanja z aktivno udeležbo študentov (razlaga, diskusija, vprašanja, primeri), • konzultacije, • vaje.

Learning and teaching methods:

<ul style="list-style-type: none"> • lectures with active student participation (explanation, discussion, questions, examples), • consultations, • tutorials.
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Načini ocenjevanja:

<ul style="list-style-type: none"> • pisni izpit

Delež (v %) /
Weight (in %)

100 %

Assessment:

<ul style="list-style-type: none"> • written exam
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Reference nosilca / Lecturer's references:

<p>(Izbranih pet nedavnih objav / Selected five recent publications)</p> <ul style="list-style-type: none"> • B. Lužar, M. Mockovčiaková, R. Soták: Revisiting Semistrong Edge-Coloring of Graphs, <i>J. Graph Theory</i> 105 (2024), 612-632. • M. Horňák, B. Lužar, K. Štorgel: 3-facial edge-coloring of plane graphs, <i>Discrete Math.</i> 346 (2023), 11312. • N. Gusmeroli, T. Hrga, B. Lužar, J. Povh, M. Siebenhofer, A. Wiegele: BiqBin: A Parallel Branch-and-bound Solver for Binary Quadratic Problems with Linear Constraints, <i>ACM Transactions on Mathematical Software</i> 48 (2022), #15. • H. La, B. Lužar, K. Štorgel: Further extensions of the Grötzsch Theorem, <i>Discrete Math.</i> 345 (2022), 112849. • I. Fabrici, B. Lužar, S. Rindošová, R. Soták: Proper conflict-free and unique-maximum colorings of planar graphs with respect to neighborhoods, <i>Discrete Appl. Math.</i> 324 (2023), 80-92.
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