1.	Course Title	Linear algebra and applications
2.	Code	F18L3W035
3.	Study program	Software engineering and information systems
4.	Study Program Organizer	Faculty of Computer Science and Engineering
5.	Degree (first, second, third cycle)	first cycle
6.	Academic year / semester 3 / winter / optional	7. ECTS credits 6
8.	Teacher	full professor Zhaneta Popeska, full professor Verica Bakeva, associate professor Marija Mihova, assistant professor Simona Samardzhiska, assistant professor Natasha Ilievska, assistant professor Vesna Dimitrievska Ristovska, assistant professor Aleksandra Popovska Mitrovikj
9.	Course enrollment prerequisites	Дискретна математика или Дискретни структури 2
10.	Course program goals (competencies): In this course you will learn the concepts and methods of linear algebra, and how to use them to think about problems arising in computer science.	
11.	Course program content: . Linear geometry: Vectors in R2 and R3, dot product, angel between two vectors, cross product in R3, lines and planes and applications. Linear equations and matrices: Matrix operations and properties, special types of matrices, transpose of a matrix symmetric matrices, diagonal matrices, inverse of a matrix. Solution of system of linear equations: Gaussian elimination, geometric interpretation of solution set. Elimination with matrices: elementary matrices, elimination and permutation matrices. LU – factorization. Reduced echelon form of a matrix. Real vector spaces: Definition of a vector spaces and subspaces, linear independence, basis and dimension of a vector space. Vector spaces and homogeneous systems, rank of a matrix and applications. Coordinates and change of basis. Applications. Orthogonal basis in Rn and orthogonal complement. Linear transformations, definition and examples. The kernel and range of a linear transformation, The matrix of a linear transformation. Orthogonal projection and applications. Determinants and properties. Eigenvalues and eigenvectors, diagonalization, diagonalization of symmetric matrices and applications. SV decomposition of matrices.	
12.	Learning methods: Lectures using presentations, interactive lectures, exercises (using equipment and software packages), teamwork, case studies, invited guest lecturers, independent preparation and defense of a project assignment and seminar work.	

13.	Total available time		6 ECTS x 30 hours = 180 hours	
14.	Distribution of the available time		30 + 45 + 0 + 15 + 90 = 180 hours	
15.	Teaching activity forms	15.1.	Lectures – theoretical teaching	30 hours
		15.2.	Exercises (laboratory, auditory), seminar papers, teamwork	45 hours
16.	Other activity forms	16.1.	Project Tasks	0 hours
		16.2.	Independent Learning Tasks	15 hours
		16.3.	Home learning	90 hours

17.	Assessment methodology		
	17.1.	Tests	0 points
	17.2.	Seminar paper/project (presentation: written and oral)	0 points
	17.3.	Activity and learning	20 points
	17.4.	Final exam	80 points

18.	Assessment criteria (points/grade)	up to 50 points	5 (five) (F)
		51 to 60 points	6 (six) (E)
		61 to 70 points	7 (seven) (D)
		71 to 80 points	8 (eight) (C)
		81 to 90 points	9 (nine) (B)
		91 to 100 points	10 (ten) (A)
19.	Course completion and final exam requirements	Realized activities 15.1 and 15.2	
20.	Teaching Language	Macedonian and English	
21.	Teaching quality evaluation method	Internal evaluation mechanisms and questionnaires	
22.	Course Material		
	22.1.	Mandatory course material	

	No.	Author	Title	Publisher	Year
	1	David C. Lay	Linear Algebra and its Applications	Addison-Wesley	2012
	2	Jim Hefferon	Linear Algebra	http://joshua.smcvt.edu/linearalgebra	2014
	3	Bernard Kolman & David R. Hill	Introductory Linear Algebra An Applied First Course 8/E	Pearson Education International	2005

22.2. Additional course material

No.	Author	Title	Publisher	Year