COURSE NAME	Combinatorial and discrete mathematics and algorithms					
Code	PMIG30	Year of study	The third year of undergraduate study			
Course teacher	Damir Vukičević	Credits (ECTS)	7,0			
Associate teachers	Aljoša Šubašić	Type of instruction (number of hours)	P	S	V	T
			45		45	
Status of the course	Compulsory course	Percentage of application of e-learning	5			
COURSE DESCRIPTION						
Course objectives	Student learns basics of combinatorics and discrete mathematics as well as basic algorithms for generation and enumeration of combinatorial objects. Also he learns basic methods for the calculation of the algorithm complexity.					
Course enrolment requirements and entry competences required for the course	Prerequisites: introductory mathematical course completed. Required competencies: knowledge of elementary mathematics, series					
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	Student is able to: - define basic combinatorial structures - applied learned formulas and methods in solving combinatorial problems - solve simpler graph theoretical problems - apply learned algorithms - evaluate quality of (simpler) algorithms					
Course content broken down in detail by weekly class schedule (syllabus)	1) Combinatorial enumeration. Permutations and combination of sets and multisets. Binomial and multinomial coefficients. (6 sati) 2) Examples and applications. (9 sati) 3) Recursions. Linear recursions and solving. (6 sati) 4) Generation of combinatorial structures. Calculation of binomial and multinomial coefficients. Application of recursions in the algorithm complexity analysis. (6 sati) 5) Basic notion of graph theory. Cycles and tree. (6sati) 6) Graph coloring. Digraphs. Planar graphs. Matching. (6 sati) 7) Graph storing in computer. Dijxtra algorithm. Kruskal algorithm. Flury algorithm. Graph components detection. Hungarian method algorithm and other perfect matching algorithms. Complex networks. (6 sati)					
Format of instruction	Lectures and exercises.					

Student responsibilities	Lecture attendance.
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)*	Lecture attendance: 2.25 ECTS. Partial exams and final (written and oral) exam: 4.75 ECTS.
Grading and evaluating student work in class and at the final exam	Partial exams and final (written and oral) exam.
Required literature (available in the library and via other media)	1) D. Veljan, *Kombinatorna i diskretna matematika*, Algoritam, Zagreb, 2001. 2) D. Veljan, *Kombinatorika s teorijom grafova*, Školska knjiga, Zagreb, 1989. 3) M. Cvitković, *Kombinatorika, zbirka zadataka*, Element, Zagreb, 1994.
Optional literature (at the time of submission of study programme proposal)	1) D. L. Kreher, D. R. Stinson, *Combinatorial Algorithms – Generation, Enumeration and Search*, CRC Press, Boca Raton, 1999. 2) J. Matoušek, J. Nešetril*, Invitation to Discrete Mathematics*, Oxford University Press, Oxford, 1998. 3) R.J. Wilson, *Introduction to Graph Theory*, Longman, Harlow, Essex, 1999.
Quality assurance methods that ensure the acquisition of exit competences	Statistics of exam results and student's course evaluation (survey according to rules of the University of Split).
Other (as the proposer wishes to add)	