<table>
<tr><td>NAZIV PREDMETA</td><td colspan="5">Složenost algoritama</td></tr>
<tr><td>Kod</td><td>PMM920</td><td>Godina studija</td><td colspan="3">2. GODINA DIPLOMSKOG STUDIJA</td></tr>
<tr><td>Nositelj/i predmeta</td><td>Jurica Perić</td><td>Bodovna vrijednost (ECTS)</td><td colspan="3">6</td></tr>
<tr><td rowspan="2">Suradnici</td><td rowspan="2"></td><td rowspan="2">Način izvođenja nastave (broj sati u semestru)</td><td>P</td><td>S</td><td>V</td><td>T</td></tr>
<tr><td>30</td><td></td><td>30</td><td></td></tr>
<tr><td>Status predmeta</td><td>OBAVEZAN</td><td>Postotak primjene e-učenja</td><td colspan="3">40%</td></tr>
<tr><td colspan="6">OPIS PREDMETA</td></tr>
<tr><td>Ciljevi predmeta</td><td colspan="5">Cilj kolegija je naučiti studente naprednijim algoritamskim konceptima. Upoznat će se sa oblikovanjem efikasnijih algoritama, te preciznom analizom njihove složenosti.</td></tr>
<tr><td>Uvjeti za upis predmeta i ulazne kompetencije potrebne za predmet</td><td colspan="5"></td></tr>
<tr><td>Očekivani ishodi učenja na razini predmeta (4-10 ishoda učenja)</td><td colspan="5">Student je sposoban:
- primijeniti naučeno za razvoj novih algoritama i izračunavanje složenosti tih algoritama
- raščlaniti svaki algoritam i analizirati osnovna svojstva (ulaz, izlaz, efikasnost, ...)
- argumentirati važnost sortiranja algoritma, prikazati i usporediti algoritme za sortiranje
- ukazati na prednosti i nedostatke pohlepnih algoritama, poduprijeti tvrdnje na rješavanje problema optimizacije (minimalno razapinjuće stablo, ...)
- izdvojiti koju metodu konstruiranja algoritama bi trebalo iskoristiti za rješavanje kojih problema, usporediti odabranu metodu sa ostalim metodama</td></tr>
<tr><td>Sadržaj predmeta detaljno razrađen prema satnici nastave</td><td colspan="5">Uvodni dio. Algoritmi, osnovna svojstva, složenost. – 2 sata
Asimptotsko ponašanje funkcija. – 2 sata
Rekurzivni algoritmi. – 4 sata
Brzo množenje matrica, algoritmi za množenje i dijeljenje, quicksort. – 4 sati
Pohlepni algoritam. – 2 sata
Algoritmi na grafovima. – 2 sata
Dijkstra, Prim, Kruskal algoritmi. – 4 sati
Minimalno razapinjuće stablo, obilazak grafa, ciklusi – 6 sata
Dinamičko programiranje – 4 sati</td></tr>
<tr><td>Vrste izvođenja nastave:</td><td colspan="2">* predavanja
☐ seminari i radionice
* vježbe
☐ on line u cijelosti
☐ mješovito e-učenje
☐ terenska nastava</td><td colspan="3">☐ samostalni zadaci
☐ multimedija
☐ laboratorij
☐ mentorski rad
☐ (ostalo upisati)</td></tr>
</table>

Obveze studenata	Prisustvo na 70% predavanja i na 70% vježbi.					
Praćenje rada studenata *(upisati udio u ECTS bodovima za svaku aktivnost tako da ukupni broj ECTS bodova odgovara bodovnoj vrijednosti predmeta):*	Pohađanje nastave	1	Istraživanje		Praktični rad	
	Eksperimentalni rad		Referat		(Ostalo upisati)	
	Esej		Seminarski rad		(Ostalo upisati)	
	Kolokviji	1.5	Usmeni ispit	2.5	(Ostalo upisati)	
	Pismeni ispit	1	Projekt		(Ostalo upisati)	
Ocjenjivanje i vrjednovanje rada studenata tijekom nastave i na završnom ispitu	Ispit se polaže u pismenom i usmenom obliku. Pismeni oblik ispita je preliminarni dio ispita i položen pismeni oblik ispita je uvjet za pristupanje usmenom ispitu. Pismeni oblik ispita može se polagati parcijalno, tijekom nastave, kada je to izvedbenim planom predviđeno. Aktivnost na nastavi, rješavanje domaćih zadaca, kolokviji, te pismeni i usmeni ispit elementi su temeljem kojih se formira konačna ocjena.					

	Naslov	**Broj primjeraka u knjižnici**	**Dostupnost putem ostalih medija**
Obvezna literatura (dostupna u knjižnici i putem ostalih medija)	T. H. Cormen, C. E. Leiserson, R. L. Rivest, Introduction to Algorithms, MIT Press, Cambridge, Massachusetts, 1990.		
	D. Knuth, The Art of Computer Programming, Vol. 1, Fundamental Algorithms, Addison-Wesley, Reading, MA, USA, 1997.		
Dopunska literatura			
Načini praćenja kvalitete koji osiguravaju stjecanje utvrđenih ishoda učenja	Statistika ispitnih rezultata i studentsko evaluiranje putem anonimne ankete na kraju izvedbe predmeta. Anketa se provodi prema pravilniku Sveučilišta u Splitu.		
Ostalo (prema mišljenju predlagatelja)			

COURSE NAME	**Complexity of algorithms**		
Code	PMM	Year of study	2nd year of graduate study
Course teacher	Jurica Perić	Credits (ECTS)	6

Associate teachers		Type of instruction (number of hours)	L	S	E	
			30		30	
Status of the course	COMPULSORY COURSE	Percentage of application of e-learning	40%			
COURSE DESCRIPTION						
Course objectives	Students will acquire knowledge in advanced algorithmic concepts. They will become familiar with designing efficient algorithms and precise analysis of their complexity.					
Course enrolment requirements and entry competences required for the course						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	The student is able to: - apply studied material for the development of new algorithms and calculate complexity of these algorithms - analyze each algorithm and analyze its basic properties (input, output, efficiency, …) - argue the importance of sorting algorithms, reproduce and compare sorting algorithms - argue advantages and disadvantages of greedy algorithms, support claims on solving optimization problems (minimum spanning tree, ...) - distinguish which method of constructing algorithms should be used for solving particular problems, compare the chosen method with other methods					
Course content broken down in detail by weekly class schedule (syllabus)	Introduction. Algorithms, basic properties, complexity. - 2 hours Asymptotic behavior of functions. - 2 hours Recursive algorithms. - 4 hours Fast matrix multiplication, algorithms for multiplication and division, quicksort. - 4 hours Greedy algorithm. - 2 hours Algorithms on graphs. - 2 hours Dijkstra, Prim, Kruskal algorithms. - 4 hours Minimum spanning tree, graph search, cycles - 6 hours Dynamic programming - 4 hours					
Format of instruction	Lectures, exercises.					
Student responsibilities	Attendance at 70% of lectures and 70% of exercises.					

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)*	Attendance – 1 ECTS Colloquium – 1.5 ECTS Written exam – 1 ECTS Oral exam – 2.5 ECTS
Grading and evaluating student work in class and at the final exam	The exam is taken in written and oral form. Written exam is preliminary part of the exam and requirement for the oral exam is to pass a written exam. The written form of the exam can be taken partially, during class, where curriculum provided. Activity in class, solving homework, colloquium, written and oral examination are the elements from which form the final grade is formed.
Required literature (available in the library and via other media)	T. H. Cormen, C. E. Leiserson, R. L. Rivest, Introduction to Algorithms, MIT Press, Cambridge, Massachusetts, 1990. D. Knuth, The Art of Computer Programming, Vol. 1, Fundamental Algorithms, Addison-Wesley, Reading, MA, USA, 1997.
Optional literature (at the time of submission of study programme proposal)	
Quality assurance methods that ensure the acquisition of exit competences	Statistics of test results and student evaluation via anonymous questionnaires at the end of the course. The survey is conducted according to the rules of the University of Split.
Other (as the proposer wishes to add)	