

Specifikacija predmeta			
Naziv predmeta		Kreativnost u elektrotehnici i računarstvu	
Studijski program		Elektrotehnika i računarstvo	
Modul		Opšteobrazovni predmeti	
Tip studija		Master akademske studije (@MIT: Course#24263@Undergraduate: The Nature of Creativity)	
Broj ESPB	6	Status predmeta	izborni
Uslov	Ovaj novi predmet je smešten u proletnjem semestru.		
Cilj predmeta	U okviru ovog predmeta predstavljeni su osnovni metodi kreiranja ideja, a sa ciljem uspešnog rešavanja kompleksnih problema u industrijskoj praksi.		
Ishod predmeta	Studenti će razumeti opste principe kreativnosti. Biće sposobni da analiziraju probleme i da primene odgovarajuće metode.		
Sadržaj predmeta			
Sadržaj teorijske nastave	Imaginacija, kreativnost; metodika, analitika; hibridizacija, transdisciplinarnizacija, mendeljevizacija, granularizacija, generalizacija, konceptualizacija.		
Sadržaj praktične nastave	Praktična nastava će tematski pratiti teorijsku nastavu. Za dati problem, studenti treba da kreiraju 10 originalnih ideja po referenci broj 3, a za jednu od njih da napišu rad po referenci broj 4.		
Literatura			
1	Bohm, David, "On Creativity," London, UK, New York, NY, USA: Routledge 2004, ISBN: 0415336406 (koristi se na MIT, za domain: rational).		
2	Singer, Irving, "Feeling and Imagination," Lanham, MD: Rowman and Littlefield, 2002, ISBN: 0742512347 (koristi se na MIT, za domain: irrational).		
3	Blagojević, V., et al (svi nastavnici sa katedre RTI na ETF), "A systematic Approach to Generation of New Ideas for PhD Research in Computing", ETF, 2015. (rad još nije objavljen u SCI časopisu, ali su svi nastavnici sa katedre RTI stali iza njega, što vredi više od mišljenja dva anonimna referenta u nekom SCI časopisu).		
4	Drašković, D., et al (svi asistenti i svi nastavnici sa katedre RTI na ETF), "A systematic Approach to Presentation of New Ideas for PhD Research in Computing", ETF, 2015.		
5	Madara Ogot, Gul Okudan, "Systematic Creativity Methods in Engineering Education: A Learning Styles Perspective," Int'l Journal of Engineering Education, Vol. 22, No. 3, pp. 566-576, 2006.		
6	Richard Felder, Linda Silverman, "Learning and Teaching Styles in Engineering Education," Penn State, USA, 78(7), 674-681, 1988.		
7	Reich Yoram, Armand Hatchnel, Offer Shai, Eswaran Subrahmanian, Sweden, "A Theoretical Analysis of Creativity Methods in Engineering Design: Casting and Improving ASIT within C-K Theory," Journal of Engineering Design, 23(2), 2012.		
8	Roni Horowitz, "Creative Problem Solving in Engineering Design, PHD Thesis, Tel Aviv University, Israel, 1999.		
9	Belinda Lopez-Mesa, Graham Thompson, "The Application of the 4ps Model to the Management of Creativity and Innovation in Product Development," PHD Thesis, U. of Lulea, Sweden, 2002.		

10	Barbara Motyl, Stefano Filippi, "Comparison of Creativity Enhancement and Idea Generation Methods in Engineering Design Training," U. of Udine, Italy, in Proc. of HCH 2014, pp.242-250, 2014.			
<b>Broj časova aktivne nastave nedeljno tokom semestra/trimestra/godine</b>				
Predavanja	Vežbe	Don	Studijski i istraživački rad	Ostali časovi
2	1		2	
<b>Metode izvođenja nastave</b>				
Predavanja	Slajdovi za predavanja preuzeti su delimicno sa portala odgovarajućeg predmeta na univerzitetu MIT (sa dozvolom autora), a delimicno su originalno formirani od strane V. Milutinovica.			
Auditorne vežbe	Slajdovi za auditorne vežbe su formirani na ETF.			
Projekat	Svaki student, iz problematike u okviru oblasti elektrotehnike i računarstva, za dati industrijski problem po izboru (svaki student radi na razlicitem problemu), generise 10 novih ideja, na bazi 10 predavanih metoda, imajući u vidu postavke iz dve predavane knjige. Zatim, jednu od 10 ideja razradi i prikaze u nekom od alata za prezentiranje ideja i napiše metodološki korektan rad o njoj.			
Ispit	Ispitna pitanja će biti rađena po ugledu na odgovarajući MIT predmet. Učesnici međunarodnih takmičenja iz kreativnosti (samo ACM I IEEE takmicenja), koji ostvare zapažene rezultate do trenutka zaključivanja finalne ocene, dobijaju do 10 dodatnih poena (odluka o tačnom broju poena je diskreciono pravo predavača).			
<b>Ocena znanja (maksimalni broj poena 100)</b>				
Predispitne obaveze		Poena	Završni ispit	Poena
Aktivnosti u toku predavanja		0	Pismeni ispit	50
Praktična nastava		0		
Projekti		50		
Kolokvijumi		0		
Seminari		0		

Course specification			
Course title		Creativity in Electrical and Computer Engineering	
Study programme		Electrical Engineering and Computing	
Module		General Subjects	
Type of study		Master Academic Studies	
ESPB	6	Status	elective
Condition	This course is best taught in the Spring semester.		
The goal	The basic methods of generation of creative ideas are taught, with a stress on industrial challenges.		
The outcome	After taking this course, the students will be able to understand the basic principles of creativity and will be able to create and analyze ideas in a methodologically correct way.		
Contents			
Contents of lectures	Imagination, Creativity; Methodics, Analytics; Hybridization, Transdisciplinaryization, Mendelyeyevization, Granularization, Generalization, Conceptualization.		
Contents of exercises	Same as for the theoretical lessons. Students are asked, for a given problem, to determinate 10 different original ideas using the methodology from reference number 3, and to write a research paper using the methodology from reference number 4. The work is accompanied with an intensive in-class discussion.		
Literature			
1	Bohm, David, "On Creativity," London, UK, New York, NY, USA: Routledge 2004, ISBN: 0415336406.		
2	Singer, Irving, "Feeling and Imagination," Lanham, MD: Rowman and Littlefield, 2002, ISBN: 0742512347.		
3	Blagojevic, V., et al (all PhD teachers from RTI at ETF), "A systematic Approach to Generation of New Ideas for PhD Research in Computing", ETF, 2014.		
4	Draskovic, D., et al (all teachers from RTI at ETF), "A systematic Approach to Presentation of New Ideas for PhD Research in Computing", ETF, 2014.		
5	Madara Ogot, Gul Okudan, "Systematic Creativity Methods in Engineering Education: A Learning Styles Perspective," Int'l Journal of Engineering Education, Vol. 22, No. 3, pp. 566-576, 2006.		
6	Richard Felder, Linda Silverman, "Learning and Teaching Styles in Engineering Education," Penn State, USA, 78(7), 674-681, 1988.		
7	Reich Yoram, Armand Hatchnel, Offer Shai, Eswaran Subrahmanian, Sweden, "A Theoretical Analysis of Creativity Methods in Engineering Design: Casting and Improving ASIT within C-K Theory," Journal of Engineering Design, 23(2), 2012.		
8	Roni Horowitz, "Creative Problem Solving in Engineering Design, PHD Thesis, Tel Aviv University, Israel, 1999.		
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Number of hours per week during the semester / trimester / year				
Lectures	Exercises	OTC	Study and Research	Other classes
2	2		1	
Methods of teaching				
Lectures	Slides are partially taken (with permission) from MIT, and partially generated at ETF in Belgrade.			
Exercises	Slides are fully generated at ETF in Belgrade.			
Project	Each student selects a different industrial R+D problem, generates 10 ideas using 10 different creativity methods taught (using the principles from two textbooks taught), chooses the most mature idea, presents it using the presentation method taught, and writes a paper about it.			
Final exam	Written questions are to be answered. Laureates of student contests in creativity (only ACM or IEEE) could get up to 10 extra points towards the final grade.			
Knowledge score (maximum points 100)				
Pre obligations	Points	Final exam	Points	
Activities during lectures	0	Test paper	50	
Practical lessons	0			
Projects	50			
Colloquia	0			
Seminars	0			

## Nastava po časovima

1.	Uvod
2.	Osnovne postavke
3.	Metode generisanja i predstavljanja novih ideja u industrijskim istraživanjima
4.	Metode generisanja i predstavljanja novih ideja u akademskim istraživanjima i u nastavi
5.	Imaginativnost po knjizi čiji je autor David Bohm
6.	Kreativnost po knjizi čiji je autor Irvine Singer
7.	Hibridizacija: Teorija i primeri
8.	Transdisciplinarnost: Teorija i primeri
9.	Mendeljejevizacija: Teorija i primeri
10.	Granularizacija: Teorija i primeri
11.	Generalizacija: Teorija i primeri
12.	Analiza studentskih radova (1)
13.	Analiza studentskih radova (2)
14.	Analiza studentskih radova (3)