

**The Name of Institution:**

*School of Electrical Engineering,  
University of Belgrade*

<i>Description of an Individual Course Unit</i>							
<b>Course Code:</b>	IR3E	<b>Level of Course:</b>	Undergraduate	<b>ECTS</b>	6	<b>Semestre:</b>	6
<b>Course Title:</b>	Electromagnetics			<b>Year of Study:</b>		3	
<b>Prerequisites:</b>	None			<b>Type of course:</b>	Elective		
<b>Lecturer(s):</b>	Prof. Dr Dejan Tošić / Prof. Dr Vladimir Petrović						
<b>Course Staff:</b>	Dr Marija Nikolić / Miodrag Tasić / Dragan Olćan						
<b>Objective of the course:</b>	<p>To introduce basic engineering electromagnetics as required for mobile, microwave, and optical communications, radar, fast digital computer interconnections, wireless systems, satellite communications, and electromagnetic compatibility and hazards.</p> <p>To provide student with ability to identify, formulate, and solve basic engineering problems requiring knowledge of electromagnetics, and to understand the principles of operation of typical electromagnetic-based devices that are essential to modern communication technologies.</p>						
<b>Course Contents:</b>	Definitions, basic integral expressions and integral equations of electrostatic, stationary and quasi-stationary electromagnetic fields. Differential equations of electromagnetic fields. General form of boundary conditions. Maxwell equations: integral form, differential form, and boundary conditions. Maxwell equations in frequency domain. Polarization of electromagnetic fields. Electric properties of materials. Lorentz gauge. Retarded potentials. Distribution of energy in electromagnetic field. (Poynting theorem). Forces in electromagnetic field. Wave equations. Uniform plane electromagnetic waves in dielectrics with and without losses and in good conductors. Reflection and refraction of waves. TEM, TE and TM guided waves. Basic theory of transmitting and receiving antennas.						
<b>Teaching Methods:</b>	45 hours of lectures + 30 hours of supervised problem classes and midterm tests. Approximately 75 hours of personal study and exercise (3 hours per week during semestre, and approximately 30 hours of preparation during exam term).						
<b>Literature:</b>	A. R. Đorđević, <i>Elektromagnetika</i> , Beograd: Akademska misao, 2008. B. D. Popović, <i>Elektromagnetika</i> , Beograd: Akademska misao, 2004. J. Surutka, <i>Elektromagnetika</i> , Beograd: Akademska misao, 2006.						
<b>Assessment methods:</b>	<b>Exam</b> – 3 hour examination – 2 problems (20 points each) and 6 theoretical questions (5 points each). <b>Midterm Tests</b> – 2.5 hours examination – 2 problems (10 points each) and 4 theoretical questions (2.5 points each).						
<b>Language of instruction:</b>	Serbian	<b>Date:</b>	02.03.2009.	<b>Signature:</b>			

Ime institucije:

*Elektrotehnički fakultet,  
Univerzitet u Beogradu*

<i>Informacije o predmetu</i>							
Šifra kursa:	IR3E	Nivo kursa:	Osnovne studije	ESPB	6	Semestar:	6
Naziv kursa:	Elektromagnetika			Godina studija:		3	
Preduslovi:	Nema			Tip kursa:	Izborni		
Predavač(i):	Prof. dr Dejan Tošić / Prof. dr Vladimir Petrović						
Saradnici:	dr Marija Nikolić / Miodrag Tasić / Dragan Olćan						
Ciljevi kursa:	<p>Da uvede osnove inženjerske elektromagnetike shodno potrebama mobilnih komunikacionih sistema, mikrotalasne tehnike, optičkih telekomunikacija, radarskih sistema, brzih digitalnih računarskih veza, bežičnih sistema, satelitskih telekomunikacija i elektromagnetske kompatibilnosti.</p> <p>Da obuču studenta da može da prepozna, formuliše i reši osnovne inženjerske probleme koji zahtevaju znanja elektromagnetike i da razumeju principe rada tipičnih uređaja temeljenih na principima elektromagnetike, koji su nezaobilazni u modernim komuikacionim tehnologijama.</p>						
Sadržaj kursa:	<p>Definicije, osnovni integralni izrazi i integralne jednačine elektrostatičkog, stacionarnog i sporopromenljivog elektromagnetskog polja. Diferencijalnih jednačina elektromagnetskog polja i opšteg oblika graničnih uslova. Maksvelove jednačine: integralni i diferencijalni oblik i granični uslovi. Maksvelove jednačine u kompleksnom domenu. Polarizacija polja. Električne osobine materijala. Lorencov uslov i zakasneli potencijali. Raspodela energije elektromagnetskog polja (Pointingoba teorema). Sile u elektromagnetskom polju. Talasna jednačina. Ravni uniformni elektromagnetski talasi u dielektricima sa i bez gubitaka i dobrim provodnicima. Odbijanje i prelamanje talasa. TEM, TE i TM vođeni talasi. Osnovne teroija predajnih i prijemnih antena.</p>						
Metodi predavanja:	<p>45 časova predavanja + 30 časova vežbi na tabli sa rešavanjem zadataka, kolokvijum na sredini semestra.</p> <p>Ukupno 75 časova samostalnog učenja i vežbanja, od čega 3 časa nedeljno tokom semestra i približno 30 časova pripreme u ispitnom roku.</p>						
Literatura:	<p>A. R. Đorđević, <i>Elektromagnetika</i>, Beograd: Akademska misao, 2008.</p> <p>B. D. Popović, <i>Elektromagnetika</i>, Beograd: Akademska misao, 2004.</p> <p>J. Surutka, <i>Elektromagnetika</i>, Beograd: Akademska misao, 2006.</p>						
Metodi ocenjivanja:	<p><b>Ispit</b> - U trajanju od 3 sata – 2 zadatka po 20 poena i 6 pitanja po 5 poena.</p> <p><b>Kolokvijum</b> - U trajanju od 2,5 sata – 2 zadatka po 10 poena i 4 pitanja po 2,5 poena.</p>						
Jezik nastave:	Srpski	Datum:	02.03.2009.	Potpis:			