

**The Name of Institution:**

*Faculty of Electrical Engineering,  
University of Belgrade*

<i>Description of an Individual Course Unit</i>							
<b>Course Code:</b>	OT3MT	<b>Level of Course:</b>	Undergraduate	<b>ECTS</b>	6	<b>Semester:</b>	5
<b>Course Title:</b>	Microwave Engineering			<b>Year of Study:</b>		3	
<b>Prerequisites:</b>	None			<b>Type of course:</b>	Mandatory / Elective		
<b>Lecturer(s):</b>	Dr. Antonije Đorđević, Dr. Dejan Tošić						
<b>Course Staff:</b>	Dragan Olćan, Marija Nikolić, Miodrag Tasić						
<b>Objective of the course:</b>	<ul style="list-style-type: none"> <li>✓ Introduction to basic features, equations, and engineering concepts of passive and active components and circuits for frequencies 0.3-300 GHz.</li> <li>✓ Training students to solve simpler practical tasks and identify paths for solving more complicated problems.</li> <li>✓ Provide knowledge required as the basis for subsequent microwave-engineering courses.</li> </ul>						
<b>Course Contents:</b>	<p><b>Introduction.</b> Field theory of guided TEM, TE and TM waves.</p> <p><b>Transmission lines.</b> Standing waves. Smith chart. Basic matching circuits and impedance transformers. Field analysis. Classical lines and planar lines. Transmission-line components.</p> <p><b>Waveguides.</b> Rectangular waveguides. Circular waveguides. Resonators. Waveguide components.</p> <p><b>Scattering parameters.</b> Definition and basic properties. Terminations, attenuators, phase shifters, power dividers, directional couplers, nonreciprocal devices.</p> <p><b>Introduction to microwave solid-state devices.</b> PIN diodes. Point-contact diodes. Schotky diodes. Tunnel diodes. Step-recovery diodes. Varactor diodes. Gunn diodes. IMPATT diodes. Bipolar transistors. MESFETs. Microwave integrated circuits.</p> <p><b>Introduction to microwave tubes.</b> Klystrons. Magnetrons. TWTs.</p> <p><b>Radiation of electromagnetic waves.</b> Basic concept and Hertz dipole. Transmitting and receiving antennas. Wire antennas with sinusoidal current distribution. Antenna arrays. Radiation from apertures. Microwave antennas. Scattering and radar equation.</p>						
<b>Teaching Methods:</b>	45 hours of lectures + 15 hours of supervised problem classes + 15 hours of laboratory work, and midterm test. Approximately 60 hours of personal study and exercise (3 hours per week during semester, and approximately 15 hours of preparation during exam term).						
<b>Literature:</b>	<i>Microwave Engineering</i> , A. Đorđević and D. Tošić, Akademska misao, 2006 (in Serbian). <i>Microwave Engineering: a collection of problems</i> , D. Tošić and V. Likar Smiljanić, Akademska misao, 2006 (in Serbian).						
<b>Assessment methods:</b>	<p><b>Exam</b> – Four-hour examination: 6 theoretical questions (5 points each) and 3 problems (20 points each). Successful laboratory work: 10 points. To pass the course, at least 51 points must be achieved.</p> <p><b>Midterm Test</b> – It can replace 2 questions and 1 problem at the exam.</p>						
<b>Language of instruction:</b>	Serbian	<b>Date:</b>	12.10.2006.	<b>Signature:</b>			