

## Specification for the book of courses

<b>Study program</b>		Electrical Engineering and Computer Science		
<b>Module</b>		Communications and Information Technologies - System Engineering and Radio-Communications		
<b>Type and level of studies</b>		Undergraduate Academic Studies		
<b>The name of the course</b>		Mobile Communication Systems		
<b>Lecturer (for lectures)</b>		Marković V. Vera, Marinković D. Zlatica		
<b>Lecturer/associate (for exercises)</b>		Dimitrijević Ž. Tijana, Joković J. Jugoslav		
<b>Lecturer/associate (for OFE)</b>		Dimitrijević Ž. Tijana		
<b>Number of ECTS</b>	5	<b>Course status (obligatory/elective)</b>	Obligatory	
<b>Prerequisites</b>				
Mastering the knowledge and skills in mobile communication systems. Introduction to the basic principles and techniques of mobile communications, as well as the specifics of current and future mobile systems and services that they offer.				
<b>Course objectives</b>				
Ability to understand the basic principles of mobile communication. Knowledge of the mobile communication evolution from the first to the fifth generation. Knowledge of the propagation types in different scenarios. Knowledge of the architecture of up-to-date mobile systems and the principles of functioning of system components. Knowledge of 5G systems and their role in IoT. Knowledge of methods for evaluation the quality of services in mobile networks.				
<b>Course outcomes</b>				
Ability to understand the basic principles of mobile communication. Knowledge of the mobile communication evolution from the first to the fifth generation. Knowledge of the propagation types in different scenarios. Knowledge of the architecture of up-to-date mobile systems and the principles of functioning of system components. Knowledge of 5G systems and their role in IoT. Knowledge of methods for evaluation the quality of services in mobile networks.				
<b>Course outline</b>				
Evolution of the standards of mobile communication systems. Principles of mobile communications. Cellular approach. Antennas and propagation in mobile communications. User equipment. GSM, GPRS and UMTS systems. Multiple access, handover and roaming. Packet data transfer. Power control. HSPA and HSPA + systems. Architecture, functioning, characteristics and services of the LTE and LTE Advanced system. 5G systems and their role in IoT. Trends in the mobile communications market in Serbia and in the world. Testing the quality of services in mobile networks by measuring KPI parameters (key performance indicators).				
<b>Theoretical teaching</b>				
Solving practical problems in the field of mobile communication systems. Introduction to practical methods for EM field monitoring and testing the quality of mobile services. Visits to companies.				
<b>Practical teaching (exercises, OFE, study and research)</b>				
<b>Textbooks/references</b>				
1	Teacher's script "Mobile Communication Systems" in e-form (in Serbian)			
2	Gospić N., I. Tomić, D. Popović, D. Bogojević „Development of Mobile Communications from GSM to LTE“ (in Serbian), Saobraćajni fakultet, Beograd 2010, ISBN 978-86-7395-268-0			
3	D.P. Agrawal, Q.A. Zeng, Introduction to Wireless and Mobile Systems, Thomson, 2006			
4	J. Rodriguez, "Fundamentals of 5G Mobile Networks", Wiley, ISBN: 978-1-118-86752, 2015			
5	J. Schiller, Mobile Communications, Addison-Wesley, 2000			
<b>Number of classes of active education per week during semester/trimester/year</b>				
<b>Lectures</b>	<b>Exercises</b>	<b>OFE</b>	<b>Study and research work</b>	<b>Other classes</b>
2	2	1	0	0
<b>Teaching methods</b>				
Lectures, exercises, consultations				
<b>Grade (maximum number of points 100)</b>				
<b>Pre-exam duties</b>		<b>Points</b>	<b>Final exam</b>	
<b>Activity during lectures</b>		5	<b>Written exam</b>	
<b>Exercises</b>		5	<b>Oral exam</b>	
<b>Colloquia</b>		50		
<b>Projects</b>				