Specification for the book of courses

Study program		Electrical Engineering and Computer Science	
Module		Communications and Information Technologies - Communications and Information Processing	
Type and level of studies		Undergraduate Academic Studies	
The name of the course		Advanced RF IC for communication systems	
Lecturer (for lectures)		Milić N. Dejan	
Lecturer/associate (for exercises)		Anastasov A. Jelena, Cvetković M. Aleksandra	
Lecturer/associate (for OFE)		Anastasov A. Jelena, Cvetković M. Aleksandra	
Number of ECTS	6	**Course status (obligatory/elective)**	Elective
Prerequisites			
Course objectives	Introduction to design of advanced RF devices and circuits used in telecommunications. Wireless and mobile networks present an ongoing request for low power, high performance, and low cost RF designs. The course will reflect proven concepts and discuss recent advances for next generation radio platforms.		
Course outcomes	- Analyze and design basic RF circuits and systems for communication - Understand various RF circuit blocks, highlighting design architectures and circuit implementation tradeoffs - Design RF circuits using an advanced design tool - Measure appropriate device parameters using VNA and/or spectrum analyzer		
Course outline			
Theoretical teaching	Transceiver architectures and systems issues for current wireless communications standards. Passive discrete components in RF domain. Connectors and cables. Impedance matching. Envelope detector. Narrow/wide-band amplifiers. Mixers. Voltage Controlled Oscillators. Phase-locked loop IC's. Frequency synthesis. Low Noise Amplifiers and Limiting Amplifiers. Variable Gain Amplifiers and Automatic Gain Control. Logarithmic amplifiers. Frontends. Simulation of circuit models. IC examples, datasheet/application note mining.		
Practical teaching (exercises, OFE, study and research			
Textbooks/references			
1	Thomas H. Lee, The design of CMOS radio-frequency integrated circuits, New York, NY, USA : Cambridge University Press, 2003.		
2	B. Razavi, RF Microelectronics, Upper Saddle River, New Jersey: Prentice Hall PTR, 1998		
3			
4			
5			

Number of classes of active education per week during semester/trimester/year				
Lectures	**Exercises**	**OFE**	**Study and research work**	**Other classes**
2	2	1	0	0

Teaching methods	Course will include hardware team projects that will provide hands-on laboratory experience for the students. Student teams will be assembled depending on the complexity of the projects and individual student's interests. Projects include discrete prototype manufacture of the designed circuits as RF-modules and evaluation of their performance.

Grade (maximum number of points 100)			
Pre-exam duties	**Points**	**Final exam**	**Points**
Activity during lectures	5	**Written exam**	30
Exercises	30	**Oral exam**	20
Colloquia	15		
Projects			