

Description of an Individual Course Unit

Study program		Electrical Engineering and Computing		
Module		Telecommunications and Information Technologies		
Type and level of studies		bachelor academic studies		
Course title		Microwave electronics		
Professor (for lectures)		prof. dr Milan Ilić, doc. dr Slobodan Savić		
Professor/assistant (for practice)		prof. dr Milan Ilić, prof. dr Slobodan Savić		
Professor/assistant (for LAB)				
Number of ECTS		6	Type of the course (mandatory/elective)	mandatory
Prerequisite	None.			
Objective of the course	Define basic concepts of active microwave components and explain the major characteristics of operation.			
Learning outcomes of the course	Gain theoretical knowledge and hands-on experience in analysis and design of simple microwave electronic circuits. Learn efficient and competent use of modern CAD tools. Acquire proficiency in critical evaluation of trade-offs between the design goals, in obtaining solutions that yield optimal performance, in manufacturing physical prototypes, and in design validation by measurements.			
Course Contents				
Theoretical contents	S-parameters. Signal flow charts. Matching networks. Transistors at high frequencies (BJT, HEMT, pHEMT, mHEMT). Microwave linear transistor amplifiers. Stability circles. Constant gain circles. Constant noise-figure circles. Low-noise and broadband amplifiers. Harmonic balance analysis. Gain compression. Power amplifiers. Oscillators. Phase noise. Microwave integrated circuits.			
Practical part (practices, LAB, study research work)	Design of microwave transistor amplifier. CAD design, optimization, PCB prototype manufacturing, soldering of discrete components and design verification by measurements of the relevant parameters in the laboratory.			
Literature				
1	M. Ilić, S. Savić: Microwave electronics, Belgrade: Academic mind, 2016 (in Serbian).			
2				
3				
4				
5				
Number of ECTS				
Lectures	Practices	LAB	Study research work	Other activities
45	15	15		
Teaching Methods	Lectures, problem-solving classes, CAD exercises and laboratory work.			
Grading methods (max. number of points is 100)				
Pre-exam assessments	points	Final examination		points
activity during lectures		written exam		30
practical assessments	40	oral exam		
projects	30			
seminars				