

	Course name: EE444 Microwave Engineering 1		Department: Electrical and Electronics Engineering		Semester 8	
	Methods of Education					Credit (ECTS)
	Lecture	Study Time	Homework	Exam (incl. Preparation)	Total	5
	36	40	44	30	146	
Language	English					
Compulsory/Elective	Elective					
Prerequisites	EE303 (Electromagnetic Fields) & EE304 (Electromagnetic Waves)					
Course Contents	TRANSMISSION LINES – WAVEGUIDES – MICROWAVE NETWORK ANALYSIS IMPEDANCE MATCHING AND TUNING – MICROWAVE RESONATORS					
Course Objective	To teach the fundamentals of Microwave/Radio-frequency (ME/RF) systems					
Learning Outcomes and Competences	<p>Students who pass the course will be able to:</p> <ul style="list-style-type: none"> – Analyze lossless TL and find its parameters and relate those parameters to the operation of the TL under different conditions. – Use Smith chart in solving TL problems – Analyze transient and termination of lossy TL – Recognize and Analyze different types of waves (TEM, TE and TM) – Analyze different types of waveguides and their modes of operations – Learn how basic circuit and network concepts can be extended to handle many microwave analysis and design problems of practical interest. – Recognize and use different types of network representation (Z, Y, S and ABCD) of microwave circuits and gain the ability to move from one representation to the other – Understand a number of MW circuit matching techniques and how to apply them – Study and analyze a number of MW resonators. 					
Textbook and /or References	“Microwave Engineering”, 4th edition, D. M. Pozar, Wiley, 2012.					
Assessment Criteria			If any, mark as (X)	Percentage (%)		
	Midterm Exams		X	25		
	Quizzes					
	Homework		X	15		
	Projects		X	10		
	Term Paper					
	Laboratory work					
	Other					
Final Exam		X	50			
Instructors	Prof. dr. Alaaeldeen Elrouby					
Weekly Schedule						
Week	Subject					
1	Introduction					
2	Lossless TL – TL Parameters – Terminated Lossless TL					
3	Smith Chart – The Slotted Line – The Quarter-Wave Transformer – TL transient.					
4	TL Mismatches – Lossy TL – Transient and Termination of lossy TL					
5	Waveguides 1					
6	Waveguides 2					
7	Waveguides 3					
8	Network Analysis 1					
9	Mid-term Exam					
10	Network Analysis 2					
11	Impedance Matching 1					
12	Impedance Matching 2					
13	MW Resonators 1					
14	MW Resonators 2					
15	Noise Figure Analysis					