



University of Tehran
School of Electrical and Computer Engineering

Course:	8101041 – Microwave Laboratory									
Course type:	EE*						CE*			Credit: 3
	Com	E	P	B	Con	D	SW	HW	IT	
	Required	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Elective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Level:	Undergraduate <input checked="" type="checkbox"/> Graduate <input type="checkbox"/>									
Co-requisite(s):	None									
Prerequisite(s):	Microwaves I (8101328)									
Prerequisite by topic:	Fields and waves, waveguides, antennas.									
Textbook(s):	[1] Lecture notes, Web material [2] D. M. Pozar, <i>Microwave Engineering</i> , Addison-Wesley, 1990									
Coordinator:	J. Rashed-Mohassel, Professor, School of ECE									
Goals:	To introduce fundamentals of microwave and antenna measurements, familiarization with passive and active microwave devices and antennas, design, simulation and testing of passive microwave devices									
Outcome:	Upon successful completion of the laboratory, students should be familiar with: <ol style="list-style-type: none"> 1. Microstrips 2. Rectangular Waveguides 3. Attenuation in Waveguides 4. Design of Couplers 5. Fundamental microwave and antenna measurements 6. Passive microwave devices 7. Different frequency bands 8. Doppler radar 9. Spectrum analyzer 10. Network analyzer 									
Topics:	6-8 experiments and one design project:									

	<ol style="list-style-type: none"> 1. The study of a reflex klystron 2. Frequency, wavelength and attenuation measurements 3. SWR and impedance measurements 4. Fundamental antenna measurements 5. Directional coupler and associated measurements 6. The study of Doppler effect 7. Swept frequency measurements 8. Study of a waveguide hybrid-T 9. Pin diode characteristics 10. Familiarization with network analyzer and spectrum analyzer 11. design, simulation, fabrication and test of a passive microwave device 				
Computer usage:	HP-HFSS, HP-ANSOFT, MW OFFICE, NEC, WIPL,				
Assignments:	6-8 Lab reports –one design project				
Projects:	One final project: design, simulation, fabrication and test of a passive microwave device: multisection or tapered impedance transformer, power divider, directional coupler, 180° hybrid...				
Grading:	<table style="width: 100%; border: none;"> <tr> <td style="width: 70%;">Assignments and Quizes</td> <td style="text-align: right;">60%</td> </tr> <tr> <td>Final Project:</td> <td style="text-align: right;">40%</td> </tr> </table>	Assignments and Quizes	60%	Final Project:	40%
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Final Project:	40%				
Further readings:	<ol style="list-style-type: none"> 1. R. E. Collin, <i>Foundations for Microwave Engineering</i>, 2nd Ed., McGraw-Hill, 1992 2. Web materials, 				
Prepared by:	J. Rashed-Mohassel				
Date:	Sept. 15, 201 ^v				

*EE: Electrical Engineering		CE: Computer Engineering	
Com	Communications	SW	Software
E	Electronics	HW	Hardware
P	Power	IT	Information Technology
B	Bioelectronics		
Con	Control		
D	Digital System		