FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Engineering & Technology

Microwave Engineering

Information :

Course Code :	COM 415	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Specialization of Electronics & Communication

Instructor Information :

Title	Name	Office hours
Professor	Ahmed Hisham Eissa Ahmed Morshed	2
Assistant Lecturer	Ahmed Essam Fahim Zahran	3

Area Of Study :

ÅEnrich studentsôknowledge about the different field expressions.
ÅPrepare students to differentiate between different kinds of waveguides and cavity resonators.
ÅTrain students to identify different types of microwave filters & micro-strip lines used in their design.

Description :

Equivalent circuit of waveguides: N-port circuit, circuit description, scattering parameters, excitation of wave guides, waveguides coupling by aperture, Passive devices: terminations, attenuators, phase shifters, directional couplers, Hybrid junctions, Circuit theory of resonators, Fabry Perot and optical resonators, Microwave measurements, detection and measurement of microwave power, measurement of wavelength, and measurement of impedance. Ferrites

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Describe different elements of microwave systems.
2 -	Summarize design problems for waveguides cavity resonators and filters.
b.Intellectual Skills: :	
1 -	Develop ideas in structural and mathematical terms so that quantitative evaluation is facilitated.
2 -	Create solutions for microwave networks
3 -	Evaluate obtained results both individually or as a part of team.
c.Professional and Practical Skills: :	
1 -	Application of microwave slotted line.
2 -	Measurements of dielectric constants of different dielectric materials.
d.General and Transferable Skills: :	
1 -	Work coherently and successfully as a part of a team in the Lab., projects, and assignments.
2 -	Communicate Effectively.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Waveguides- planar	5	3	2
Modes (TEM, TE, and TM) general field equations	5	3	2
Rectangular Waveguide, Circular Waveguide (modes, power, attenuation 1st Midterm	15	9	6
Cavity resonators: resonance frequency- quality factor	15	9	6
2nd Midterm Filters- insertion loss- maximally flat, equal ripple- LPF, HPF, BPF, and BSF	15	9	6
Impedance ï frequency scaling, and implementation	20	12	8

Teaching And Learning Methodologies :

Interactive Lecturing
Discussion
Problem Solving
Experiential Learning

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments	10.00		
Final Exam	40.00		
Lab	10.00		
midterms	30.00		
quizzes	10.00		

Recommended books :

R.E.Collin," Foundation for Microwave Engineering" Wiley, 2001