

Faculty of Engineering & Technology

Antennas and Propagation

Information :	COM 521		Undergraduate		2.00 Hours
Course Code :	COIVI 52 I	Level :	Undergraduate	Course nours :	3.00- Hours
Department :	Specialization of Elect	ronics & Comn	nunication		
Instructor Infor	mation :				
Title		Name			Office hours
Professor		Ibrahim Ahmed Mohamed Salem			
Lecturer		Ahmed Shaker Hassan Mahmoud			
Assistant Lecturer		Ahmed Essam Fahim Zahran			4

Ahmed Essam Fahim Zahran

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Area Of Study :

Assistant Lecturer

1- Enrich students' knowledge of the Antenna theory, Types, Analysis and Design.

2- Develop students' skills in the design of dipoles, Horns, reflector antennas.

3- Enrich students' knowledge about the different Satellite antennas.

Description :

The course of antenna includes the study, analysis, and design of:

Antenna types and antenna parameters, Wire antennas: small wire antenna, dipoles, monopole, folded – loop antenna, helical antennas (normal, and axial)- travelling wave antenna (including rhombic antennas). Arrays: broadside- binomial- Chybeshev, end fire array, and phased arrays. Aperture antennas: open end waveguides (rectangular, and circular apertures). Horns: sectoral, pyramidal, and conical horns. Reflectors: single, double and corner reflectors. Lens antennas: dielectric and parallel plates. Wide band antennas (spiral- LPDA). Microstrip antennas.

Course outcomes :

a.Knowledge and Understanding: :			
1 -	Explain the fundamental antenna terms and parameters, field patterns, Polarization Loss Factor (PLF), the antenna efficiency, and the antenna gain.		
2 -	Recognize the radiation characteristics of the dipole antennas, and the aperture antennas.		
3 -	Estimate the different horn types, and determination of the geometrical parameters, the Power Budget, and (C/No) ratio for a communication Channel.		
4 -	Recognize the parabolic reflector antenna, the cassegrain system and the applications for the different antenna types.		
5 -	Explain the construction and functions of the control ground stations (GCS) for Satellite control.		
b.Intellectu	al Skills: :		
4	Design of the different entenne systems calculations using different techniques		

1 - Design of the different antenna systems calculations using different techniques.



2 -	Analyze the performance of different antenna systems.		
c.Professional and Practical Skills: :			
1 -	Measure the antenna field pattern, to determine HPBW, FNBW and SLL.		
2 -	Measure of the antenna VSWR.		
d.General and Transferable Skills: :			
1 -	Work in stressful environment and within constraints.		
2 -	Communicate effectively.		

Course Topic And Contents :

Торіс	No. of hours	Lecture	Tutorial / Practical
Introduction to antenna definition and types. Fundamental antenna parameters.	5	3	2
Field regions, radiation power density and intensity. Directive gain, directivity, efficiency and gain.	10	6	4
HPBW, FNBW, polarization of the wave and of the antenna. Polarization types, the polarization loss factor (PLF).	10	6	4
Friis transmission equation, Link budget calculations. Infinitismal dipole, radiation fields and radiation resistance.	10	6	4
Finite length dipole, Half wave dipole. Radiation patterns and radiation resistance. Input impedance.	10	6	4
Aperture antennas, rectangular aperture , Circular aperture. Radiation patterns, antenna characteristics , For different aperture field distributions. Electromagnetic horns. E-Sectoral Horn, H- Sectoral Horn . Pyramidal Horn. Conical Horn. Corrugated Horns.	20	12	8
Antenna Systems. Parabolic , Cassegrain, and Gregorian systems. GCS stations for Satellites.	10	6	4

Teaching And Learning Methodologies :

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nteractive Lecturing	
Discussion	
Problem Solving	
Experiential Learning	

Course Assessment :			
Methods of assessment	Relative weight %	Week No	Assess What
Assignments	10.00		
Final Exam	40.00		
First Mid-Term Exam	15.00		
Lab Exam	5.00		
Quizzes	15.00		
Second Mid-Term Exam	15.00		

