FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Engineering & Technology

Antennas and Propagation

Information :

Course Code :	COM 521	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Specialization of Electronics & Communication

Instructor Information :

Title	Name	Office hours
Lecturer	Ahmed Hosni Ali Mohamed Elghandour	2
Lecturer	Ahmed Hosni Ali Mohamed Elghandour	2
Assistant Lecturer	Ahmed Essam Fahim Zahran	5
Teaching Assistant	Samar Abdelmohaimen Mohamed Soliman	

Area Of Study :

1- Enrich students' knowledge of the Antenna theory, Types, Analysis and Design.
2- Develop studentsôskills in the design of dipoles, Horns, reflector antennas.
3- Enrich studentsôknowledge 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 ï 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 -	Recognize the parabolic reflector antenna, the cassegrain system and the applications for the different antenna types.
2 -	Explain the construction and functions of the control ground stations (GCS) for Satellite control.
3 -	Explain the fundamental antenna terms and parameters, field patterns, Polarization Loss Factor (PLF), the antenna efficiency, and the antenna gain.
4 -	Recognize the radiation characteristics of the dipole antennas, and the aperture antennas.
5 -	Estimate the different horn types, and determination of the geometrical parameters, the Power Budget, and (C/No) ratio for a communication Channel.
b.Intellectual Skills: :	
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 :

Topic	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 :

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		
First Mid-Term Exam	15.00		
Lab Exam	5.00		
Quizzes	15.00		
Second Mid-Term Exam	15.00		