

Module (Course Syllabus) Catalogue 2022-2023

College/ Institute	Erbil Technology College	
Department	Information and Communication Technology Engineering ICTE	
Module Name	Antenna and wave propagation	
Module Code	AWP403	
Degree	Technical Diploma <input type="checkbox"/>	Bachelor <input type="checkbox"/>
	High Diploma <input type="checkbox"/>	Master <input type="checkbox"/>
		PhD <input checked="" type="checkbox"/>
Semester	4 th Semester	
Qualification		
Scientific Title	Assistant Professor	
ECTS (Credits)	5	
Module type	Prerequisite <input type="checkbox"/>	Core <input checked="" type="checkbox"/>
		Assist. <input type="checkbox"/>
Weekly hours	4	
Weekly hours (Theory)	(2)hr Class	(3)hr Workload
Weekly hours (Practical)	(2)hr Class	(1)hr Workload
Number of Weeks	12	
Lecturer (Theory)	Ilham Kadhim Onees	
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Lecturer (Practical)	Ilham Kadhim Onees	
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Websites		

Course Book

Course Description	<p>Antenna & wave propagation is core subject & it has six units. In order to cover antenna fundamentals Lectures are arranged. As the antenna is integral part of the communication system parameters, array, measurement & micro strip antenna are covered in the subject. Propagation depends upon the type of media so types are covered. At the end one application which covers use of antenna.</p> <p>Antenna & wave Propagation course intends to build the competency in the students to understand basics. The subject is useful to understand the courses like RADAR & Navigation, Microwave Engineering.</p>
Course objectives	<p>Course Objectives:</p> <ol style="list-style-type: none">1. To define different terminologies of antenna & classify.2. To explain measurement schemes of antenna parameters.3. To distinguish among different types of wave propagation.4. To explain different types of RADAR system.
Student's obligation	<p>Student will be able to</p> <ol style="list-style-type: none">1- Describe antenna parameters.2 -Enumerate all details about broadband Antenna.

	3- Demonstrate measurement techniques of antenna & design microstrip antenna. 4- Explain ground wave propagation. 5 -Explain Ionospheric propagation. 6 -Differentiate among different RADAR systems				
Required Learning Materials					
Evaluation	Task	Weight (Marks)	Due Week	Relevant Learning Outcome	
	Paper Review				
	Assignments	Homework	5%		
		Class Activity	2%		
		Report			
		Seminar	10%		
		Essay			
		Project			
	Quiz		8%		
	Lab.		10%		
	Midterm Exam		25%		
	Final Exam		40%		
	Total		100%		
Specific learning outcome:	Course Outcome: After learning the course, the students should be able to: <ol style="list-style-type: none"> 1. Explain the radiation through antenna and identify different types of antennas. 2. Identify and measure the basic antenna parameters 3. Design and analyze wire and aperture antennas 4. Design and analyze matching and feeding networks for antennas 5. Design and analyze antenna arrays 6. Identify the characteristics of radio-wave propagation 				

Course References:	1] Antennas and Wave Propagation-G. S. N. Raju (Pearson) 2] Foundations of Antenna Theory and Techniques - Vincent F. Fusco(Pearson)	
Course topics (Theory)	Week	Learning Outcome
Introduction to Antenna and wave propagation, Types of antenna, Fundamental Parameters of Antennas (Characteristics).	1 & 2	
Electromagnetic Waves, Graphical Representation of Electromagnetic Waves, definition of wave propagation, Different modes of wave propagation.	3	
Maxwell's Equations, Integral and Differential forms. Problems with solutions.	4,5	
The Radiation pattern of antenna	6	
Antenna Losses	7	
Types of dipole antenna and Types of horn antenna	8	
types of antenna in wireless communication and Radio antenna types	9	
Mobile phone antenna type, Types of antenna used in telecommunication.	10	
Different types of antennas used in satellite communication, Broadband antenna types	11	
Types of antenna used in radar	12	
Practical Topics	Week	Learning Outcome
Introduction to microwaves, part 1/ Measuring the microwaves Signal.	1	

Introduction to microwaves, part 2/ Polarization and Reflection of the microwaves.	2	
Power Measurement.	3	
The Cavity wavemeter -Frequency measurements.	4	
Power and Attenuation Measurements.	5	
Omni directional antenna	6	
Polarization of antenna	7	
Directional antenna	8	
Study of dipole $L/2$, $L/4$, $3L/2$, Folded dipole	9	
Requirements of an antenna measuring station	10	
To observe reflections and multiple reflections on a transmission line.	11	
To measure the attenuation along the transmission line.	12	

Extra notes:

External Evaluator:

This course book has to be reviewed and signed by a peer. The peer approves the contents of the course book by writing the following sentences:

- This course book is written according to the university template.
- The course teacher put all necessary information in the course book.
- The course teacher follows the syllabus in writing the course book.

Peer reviewer name: Sevan H. Ali

