

EC527- Applied Telecommunications

CREDIT HOURS

3 Hours

CONTACT HOURS (Hours/week)

Lecture: 2; Tutorial: 2

COURSE COORDINATOR

Dr. Ashraf Mamdouh

TEXT BOOK

Soklnik, Merrill, "Introduction to Radar Systems", 3rd edition McGraw-Hill

COURSE DESCRIPTION

Introduction to radar system - Classification and principles of the radar system - The radar equation – Probability of detection - The digital radar, terminals, transmission and switching. Analog and Digital telephone networks.

PREREQUISITE:

EC 322

RELATION OF COURSE TO PROGRAM

Elective

COURSE INSTRUCTION OUTCOMES

The student will be able to develop the basic concept of communication systems as radar systems and analog and digital telephony from design and analysis point of view.

TOPICS COVERED

- Introduction: Definition and types of radar systems; advantages of using the radar systems in vision and detection of targets; construction of radar systems as a communication system block diagram.
- The radar equation: Radar equation and the mathematical proof, effect of each parameter in the radar equation, operation and testing of real radar system & Classification of radar systems: Principle of operation, operating frequency bands, function of radar systems.
- The target cross-section: Definition of target cross-section, methods of measuring target cross-section RCS.
- Noise and Probability of detection, probability of false alarm, power supply circuit description.
- Radar Integration.
- Sea augmented targets detection - Training on real radar system
- Introduction to Doppler and MTI radar.
- Staggered p.r. frequencies.
- Digital MTI processing
- Limitation to MTI performance

- Analog telephony network
- Continue: Analog telephony network
- Digital telephony network (mobile)
- Real radars (a visit to radar simulator)

CONTRIBUTION OF COURSE TO MEET THE REQUIREMENTS OF CRITERION 5:

Professional component Content			
Math and Basic Sciences	Engineering Topics	General Education	Other
	✓		

RELATIONSHIP OF COURSE TO STUDENT OUTCOMES:

Student Outcomes		Course aspects
A	An ability to apply knowledge of mathematics, science, and engineering	a ₁ a ₂
B	An ability to design and conduct experiments, analyze and interpret data.	
C	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economics, environmental, social, political, ethical, health, and safety, manufacturability, and sustainability	c ₁ c ₂ c ₃
D	An ability to function on multi-disciplinary teams.	
E	An ability to identify, formulate, and solve engineering problems	e ₁ e ₂ e ₃
F	An understanding of professional and ethical responsibility	
G	An ability to communicate effectively	
H	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and social content	h ₁ h ₄
I	A recognition of the need for, and an ability to engage in life-long learning.	
J	A knowledge of contemporary issues within and outside the electrical engineering profession.	j ₁ j ₂
k	An ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.	