



Faculty of
Engineering at
shoubra

Model No.12 Course Specifications : Radar Systems

University : Benha university

Faculty : Faculty of Engineering at Shoubra

Department : Electrical Engineering Department

1- Course Data

Course Code : ECE449

Course Title : Radar Systems

Study Year : Fourth Year

Specialization :

Teaching Hours:

Lecture : 4

Tutorial : 2

Practical :

2- Course Aim

For students undertaking this course, the aims are to:

2.1- This course covers the fundamental concepts needed to demonstrate the design and operation of radar systems

3- Intended Learning Outcomes of Course (ILOS)

a- Knowledge and Understanding

On completing this course, students will be able to:

a1- Define concepts and theories of Radar , appropriate to radar systems.(a1)

a2- Describe principles of design including elements design, process related to radar systems.(a5)

a3- **Illustrate elementary science underlying electronic engineering systems.**(a15)

a4- List microwave applications included in radar system.(a24)

b- Intellectual Skills

At the end of this course, the students will be able to:

b1-Assess and evaluate the characteristics and performance of radar systems,. (b6)

b2-Investigate the failure of components of radar systems.(b7)

c- Professional Skills

On completing this course, the students are expected to be able to:

c1-Apply knowledge of mathematics, science, information technology, design, business context and engineering practice to solve engineering problems of radar.(c1)

c2- Prepare and present technical reports in radar. (c12)

d- General Skills

At the end of this course, the students will be able to:

d 1- Work in stressful environment and within constraints.(d2)

d2- Search for information and engage in life-long self learning discipline. (d7)

4- Course Contents

No.	Topics	No of hours
1	Introduction to Radar Systems	4
2	Radar Equations	4
3	Propagation of Radar Waves	4
4	transmitters	4

5	Radar Antennas, Reflector antennas	4
6	Radar Antennas, tracking antennas	4
7	Radar Antennas, phased array	4
8	Receivers	4
9	Detection of radar signals in noise	4
10	Effect of the atmosphere, rain and snow on radar signals. Clutter	4
11	Tracking Radar	4
12	Tracking Radar	4

5- Teaching and Learning Methods

5.1- Modified Lectures

6- Teaching and Learning Methods of Disables

6.1- nothing

7- Student Assessment

a- Student Assessment Methods

1	Assignments to assess knowledge and intellectual skills.
2	Quiz to assess knowledge and intellectual skills.
3	Mid-term exam to assess knowledge, intellectual
4	Oral exam to assess knowledge, intellectual, professional and general skills.
5	Final exam to assess knowledge, intellectual.

b- Assessment Schedule

No.	Assessment	Week
1	Midterm Exam	8
2	Final Exam	15

c- Weighting of Assessments

Assessment	Weight
Mid_Term Examination	10%
Final_Term Examination	60%
Oral Examination	20 %
Practical Examination	5 %
Semester work	5 %
Other types of assessment	0 %
Total	100 %

8- List of References

a- Books

1- M. I. Skolnik "Introduction to Radar Systems", McGraw-Hill,2003 (Third edition)

- Course Coordinator : **Dr. Jehan Shehata Sami Abbas**

- Head of Department : **Prof. Dr. Sayed Aboo-Elsood Ward**



Faculty of
Engineering at
Shoubra

Model No.11A

Course Specifications : Radar Systems Radar Systems

University : Benha university

Faculty : Faculty of Engineering at Shoubra

Department : Electrical Engineering Department

Matrix of Knowledge and Skills of the course

No	Topics	Basic Knowledge	Intellectual Skills	Professional Skills	General Skills
1	Introduction to Radar Systems	a1, a2, a3, a4	b1, b2	c1, c2	
2	Radar Equations	a1, a2, a3, a4	b1, b2	c1, c2	
3	Propagation of Radar Waves	a1, a2, a3, a4	b1, b2	c1, c2	
4	transmitters	a1, a2, a3, a4	b1, b2	c1, c2	
5	Radar Antennas, Reflector antennas	a1, a2, a3, a4	b1, b2	c1, c2	
6	Radar Antennas, tracking antennas	a1, a2, a3, a4	b1, b2	c1, c2	
7	Radar Antennas, phased array	a1, a2, a3, a4	b1, b2	c1, c2	
8	Mid Term Exam	a1, a2, a3, a4	b1, b2		
9	Receivers	a1, a2, a3, a4	b1, b2	c1, c2	
10	Detection of radar signals in noise	a1, a2, a3, a4	b1, b2	c1, c2	
11	Effect of the atmosphere, rain and snow on radar signals. Clutter	a1, a2, a3, a4	b1, b2	c1, c2	
12	Tracking Radar	a1, a2, a3, a4	b1, b2	c1, c2	
13	Tracking Radar	a1, a2, a3, a4	b1, b2	c1, c2	
14	Oral Exam	a1, a2, a3, a4	b1, b2	c1, c2	d1, d2
15	Final exam	a1, a2, a3, a4	b1, b2		

- Course Coordinator : Dr. Jehan Shehata Sami Abbas

- Head of Department : Prof. Dr. Sayed Aboo-Elsood Ward

Matrix of course content and ILO's

Course Title: Radar Systems

Code: ECE449

Lecture: 4

Tutorial: 2

Practical: ----

Total:

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Program on which the course is given: B.Sc. Electrical Engineering (Communications).

Major or minor element of program: Major

Department offering the program: Electrical Engineering Department

Department offering the course: Electrical Engineering Department

Academic year / level:

.Date of specifications approval: 20/6/2010

Course content	a1	a2	a3	a4	b1	b2	c1	c2
Introduction to Radar Systems	✓		✓		✓			
Radar Equations	✓			✓			✓	
Propagation of Radar Waves	✓		✓					
Transmitters		✓	✓		✓			
Radar Antennas, Reflector antennas		✓	✓	✓			✓	
Radar Antennas, tracking antennas		✓		✓				✓
Radar Antennas, phased array		✓		✓			✓	
Receivers		✓	✓		✓			
Detection of radar signals in noise	✓			✓	✓	✓		
Effect of the atmosphere, rain and snow on radar signals. Clutter	✓			✓	✓			
Tracking Radar		✓		✓			✓	✓

Matrix of course aims and ILO's

Course Title: Radar Systems

Code: ECE449

Lecture: 4

Tutorial: 2

Practical: ----

Total: 6

Program on which the course is given: B.Sc. Electrical Engineering (Communications).

Major or minor element of program: Major

Department offering the program: Electrical Engineering Department

Department offering the course: Electrical Engineering Department

Academic year / level:

.Date of specifications approval: 20/6/2010

Course aims	a1	a2	a3	a4	b1	b2	c1	c2	d1	d2
1. covers the fundamental concepts needed to understand the design and operation of radar systems	✓		✓		✓					
2. Study radar range equation, signal to noise ratio, radar cross section	✓			✓	✓	✓	✓		✓	✓
3. Range and velocity ambiguity, radar clutter				✓	✓				✓	✓
4. Study detection and receiver design, transmitters and antenna systems		✓	✓		✓		✓	✓	✓	✓

- **Course Coordinator :** Dr. Jehan Shehata Sami Abbas

- **Head of Department :** Prof. Dr. Sayed Aboo-Elsood Ward