



# Annual Course Report

## Elective Course 3

(Radar and Sonar)

### A- Basic Information

- 1 Title and Code **Radar and Sonar EC 425**
- 2 Programme(s) on which this course is given **EC**
- 3 Academic year / Level of programme **4<sup>th</sup> year / 1<sup>st</sup> Semester**
- 4 Units/Weekly hours

Lecture  Tutorial/Practical  Total

### 5- Names of lecturers contributing to the delivery of the course

i- Prof. Kamal H. Awadalla  
Prof. Adel A. Saleeb

Course coordinator: Prof. Kamal H. Awadalla  
Prof. Adel A. Saleeb

External evaluators:

### B- Statistical Information

No. of students attending the course: No.  %

No. of students completing the course: No.  %

#### Results:

Passed: No.  %  Failed: No.  %

Grading of successful students:

Excellent: No. 36 % 10.19 Very Good: No. 70 % 19.8  
 Good: No. 92 % 26.06 Pass: No. 148 % 41.92

## C-Professional Information

### 1. Course Teaching

Topic	No of hours	Lecture
<b>1- Radar Systems</b> <ul style="list-style-type: none"> <li>• General properties of radar systems</li> <li>• Block diagram of a radar</li> <li>• Signal detection</li> <li>• Radar resolution</li> </ul>	6	2
<b>2- Radar signals and signal processing</b> <ul style="list-style-type: none"> <li>• Coherent and noncoherent signal sequences</li> <li>• Optimum and matched filters</li> </ul>	6	2
<b>3- Radar power budget analysis</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Required signal-to-noise ratio calculation</li> <li>• Radar surveillance</li> </ul>	6	2
<b>4- Target tracking</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Tracking system structure</li> <li>• Tracking devices</li> </ul>	6	2
<b>5- Radar antennas</b> <ul style="list-style-type: none"> <li>• Fundamental parameters</li> <li>• Main types of radar antennas</li> <li>• Electronically steerable antennas</li> </ul>	6	2
<b>6- Synthetic aperture radar</b>	6	2

<ul style="list-style-type: none"> <li>• Introduction</li> <li>• Model of SAR as a phased array</li> <li>• Signal processing in an SAR</li> </ul>		
<b>7- Interference protection</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• The main types of interference</li> <li>• Ground clutter and chaff level</li> </ul>	6	2
<b>Total sum</b>	<b>42</b>	<b>14</b>

**Topics taught as a percentage of the content specified:**

≥90 %        70-90 %        <70%   

**2. Teaching and Learning Methods:**

- Lectures:
- Practical Training/ Laboratory:
- Seminar/Workshop:
- Class Activity:
- Case Study:
- Other Assignments/Homework:

**Case Study**

Other assignments/homework:  
A real world project assigned.

**3. Student Assessment:**

Method of Assessment	Percentage of total
Written examination	70
Midterm exams	15
Oral Examination	0
Practical/laboratory work	0
Other Assignments/class work	15

Total 100 %

**Members of Examination Committee:**

Prof.  
Prof.  
Prof.

**Role of external evaluator:**

**4. Facilities and Teaching Materials:**

- Totally adequate
- Adequate to some extent
- Inadequate

**5. Administrative Constraints**

- Students need extra hours.....
- Insufficient class rooms and halls.
- Insufficient assistant staff members.
- Insufficient Lab. Technicians.

**6. Student Evaluation of the course: Response of Course Team**

- Insufficient background in advanced mathematics -
- Lack of Software Programs -
- Algorithms.....

**7. Comments from external evaluator(s):**

**8. Course Enhancement:**

Modification of the course contents to include up to date topics in radar systems  
Several resources and references should be included.

**9. Action Plan for Academic Year 2011 – 2012**

**Progress on actions identified in the previous year's action plan:**

Improvement Field	Weak points	Action required	Person Responsible	Completion Date
Assessment Methods	Good	-	- Faculty - Department	2014
Quality of	Good	-	- Faculty	2013

Teaching and Learning			- Department	
Learning resources	Not enough	Several resources and references should be included.		2012
Course content	1-Although the course is a radar and sonar systems , it is totally devoted to electromagnetic radars 2- Topics like ultrasonic radar and sonar systems must be studied 3- Infrared and Laser radar systems must also be studied	Modification of the course contents to include up to date topics in radar systems		2011

**Course Coordinator: Prof. Kamal H. Awadalla  
Prof. Adel A. Saleeb**

**Authorized by Department Council in :**

**Authorized by Faculty Council in:**

**Head of Department:**

Prof.

**Date:**    /    /