



Faculty of  
Engineering at  
Shoubra

## Model No.12

# Course Specifications : Communication Systems 2014 - 2015

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**University :** Benha university

**Faculty :** Faculty of Engineering at Shoubra

**Department :** Electrical Engineering Department

### 1- Course Data

Course Code : ECE311      Course Title : Communication Systems      Study Year : Third Year

Specialization :  
Teaching Hours:

Lecture : 4

Tutorial : 2

Practical :

### 2- Course Aim

For students undertaking this course, the aims are to:

- 2.1- Differentiate between analog communication and digital communication
- 2.2- Describe amplitude, frequency and phase modulation
- 2.3- Describe how analog signals can be represented in digital form

### 3- Intended Learning Outcomes of Course (ILOS)

#### a- Knowledge and Understanding

On completing this course, students will be able to:

- a- 1 - Define principles of AM and FM modulation. (a3)
- a- 2 - Explain communication systems. (a22)
- a- 3 - Study coding and decoding techniques related to Pulse Code Modulation. (a23)

#### b- Intellectual Skills

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

- b- 1 - Choose suitable solutions for communication problems based on analytical thinking. (b3)
- b- 2 - Assess the characteristics and performance of types of modulation system. (b6)
- b- 3 - Study the performance of analog communication systems for example AM and FM modulation. (b16)
- b- 4 - Analyze the performance of multiplexing of mobile communication systems. (b17)

#### c- Professional Skills

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

- c- 1 - Using knowledge of mathematics, information technology, design, and engineering practice to solve communication problems. (c1)
- c- 2 - Practice computer programming for the design and diagnostics of AM and FM modulation and demodulation. (c14)

#### d- General Skills

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

- d- 1 - Search for information and engage in life-long self learning discipline. (d7)
- d- 2 - Refer to relevant literatures. (d9)
- d- 3 - Develop skills related to creative and critical thinking as well as problem solving. (d12)

#### 4- Course Contents

No.	Topics	No of hours
1	Introduction & Revision of Signals	4
2	Amplitude Modulation: Double Sideband Suppressed Carrier (DSBSC)	4
3	Amplitude Modulation: Double Sideband (DSB)	4
4	Amplitude Modulation: Single Sideband (SSB)	4
5	Amplitude Modulation: Vestigial Sideband (VSB)	4
6	Carrier Acquisition	4
7	Concept of Instantaneous Frequency	4
8	Bandwidth of Angle-Modulated Waves	4
9	Generation of FM Waves	4
10	Demodulation of FM	4
11	Sampling Theorem	4
12	Pulse-Code Modulation (PCM)	4

#### 5- Teaching and Learning Methods

5.1- Modified Lectures

5.2- Class activity

#### 6- Teaching and Learning Methods of Disables

Not available

#### 7- Student Assessment

##### a- Student Assessment Methods

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

##### b- Assessment Schedule

No.	Assessment	Week
1	Assessment on	2, 9, 11
2	Quizzes on	5, 13
3	Mid-term exam on	8
4	Oral Exam on	14
5	Final exam on	15

##### c- Weighting of Assessments

Assessment	Weight
Midterm Examination	10 %
final Term Examination	60 %
Oral Examination	20 %
Practical Examination	0 %
Semester work	10 %
Other types of assessment	0 %
Total	100 %

## **8- List of References**

### **a- Course Notes**

1- Course notes prepared by instructor.

### **b- Recommended Books**

1- B.P. Lathi, "Modern Digital and Analog Communication Systems",  
Third Edition, Oxford University Press, 1998.

**- Course Coordinator : Dr. Mostafa Mohamed Fouda**

**- Course instructor : Dr. Mostafa Mohamed Fouda**

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



Shoubra  
Faculty of  
Engineering

## Model No.11A Course Specifications : Communication Systems 2014 - 2015

**University :** Benha university

**Faculty :** Faculty of Engineering at Shoubra

**Department :** Electrical Engineering Department

### Matrix of Knowledge and Skills of the course

No.	Topics	week	Basic Knowledge	Intellectual Skills	Professional Skills	General Skills
1	Introduction & Revision of Signals	1	a1		c1	
2	Amplitude Modulation: Double Sideband Suppressed Carrier (DSBSC)	2	a1,a2	b1, b2, b3	c1, c2	d1, d2, d3
3	Amplitude Modulation: Double Sideband (DSB)	3	a1,a2	b1, b2, b3	c1, c2	d1, d2, d3
4	Amplitude Modulation: Single Sideband (SSB)	4	a1,a2	b1, b2, b3	c1, c2	d1, d2, d3
5	Amplitude Modulation: Vestigial Sideband (VSB)	5	a1,a3	b1, b2, b3	c1, c2	d1, d2, d3
6	Carrier Acquisition	6	a1,a2	b1, b2, b3	c1, c2	d1, d2, d3
7	Concept of Instantaneous Frequency	7	a1,a2	b1, b2, b3, b4	c1, c2	d1, d2, d3
8	Mid-term Exam	8	a1,a2	b1, b2, b3, b4	c1, c2	d1, d2, d3
9	Bandwidth of Angle-Modulated Waves	9	a1,a2	b1, b2, b3, b4	c1, c2	d1, d2, d3
10	Generation of FM Waves	10	a1,a2	b1, b2, b3, b4	c1, c2	d1, d2, d3
11	Demodulation of FM	11	a1,a2	b1, b2, b3, b4	c1, c2	d1, d2, d3
12	Sampling Theorem	12	a1,a2, a3	b1, b2, b3, b4	c1, c2	d1, d2
13	Pulse-Code	13	a1, a2, a3	b1, b2, b3,	c1, c2	d1, d2

	Modulation (PCM)			b4		
14	Oral - exam	14	a1, a2	b1, b2, b3	c1, c2	d1, d2, d3
15	Final exam	15	a1, a2, a3	b1, b2, b3, b4	c1, c2	d1, d2, d3

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## **Matrix of course aims and ILO's**

**Course Title:** Communication Systems      **Code:** ECE311

**Lecture:** 4   **Tutorial :**2   **Practical:**Total: 6

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

**Major or minor element of program:** N.A.

**Department offering the program:** Electrical Engineering Department

**Department offering the course:** Electrical Engineering Department

**Academic year / level:** 2014-2015   **First semester 2014 - 2015**

**Date of specifications approval:** 20/6/2010

<b>Course aims</b>	<b>a1</b>	<b>a2</b>	<b>a3</b>	<b>b1</b>	<b>b2</b>	<b>b3</b>	<b>b4</b>	<b>c1</b>	<b>c2</b>	<b>d1</b>	<b>d2</b>	<b>d3</b>
Differentiate between analog communication and digital communication	✓									✓	✓	
Describe amplitude, frequency and phase modulation	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Describe how analog signals can be represented in digital form	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	

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