



Faculty of Engineering
at Shoubra

Model No.12

Course Specifications : Signal Analysis (2014-2015)

University : Benha university

Faculty : Faculty of Engineering at Shoubra

Department : Electrical Engineering Department

1- Course Data

Course Code : ECE221 Course Title : Signal Analysis Study Year : Second Year

Specialization : Electronic and Communication Engineering

Teaching Hours:

Lecture : 4

Tutorial : 2

Practical :

2- Course Aim

For students undertaking this course, the aims are to:

- 2.1- Represent continuous-time and discrete-time signals in both time and frequency domains.
- 2.2- Analyze signals using Fourier series, Fourier transform (continuous and discrete).
- 2.3- Represent CT signals by its samples and analyze the spectrum.
- 2.4- Draw energy and power spectrum.

3- Intended Learning Outcomes of Course (ILOS)

a- Knowledge and Understanding

On completing this course, students will be able to:

- a- 1-Define continuous time signals properties in time domain .(a1)
- a- 2-Define discrete time signals properties in time domain .(a1)
- a- 3-State continuous signals properties in frequency domain and analyze them using Fourier series and Fourier transform .(a1)
- a- 4-State discrete time signals properties and analyze them using Fourier series and Fourier transform.(a1)
- a- 5-Demonstrate methodologies of data collection interpretation and solving engineering problems to draw the energy and power spectrum.(a6)

b- Intellectual Skills

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

- b- 1 - Select appropriate mathematical for modeling different types of signals. (b1)
- b- 2 - Select appropriate solutions for engineering problems based on analytical thinking for the signal properties and applications.(b3)
- b- 3 - Think in a creative and innovative way in problem solving and design of communication systems. (b4)

c- Professional Skills

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

- c- 1 - Apply knowledge of signal types and properties to solve engineering problems.(c1)
- c- 2 - Use a wide range of analytical tools, and software packages to study Fourier series and Fourier transform properties.(c6)
- c- 3 - Apply numerical modeling methods for communication systems.(c7)

d- General Skills

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

d- 1- Effectively manage tasks, time, and resources. (d6)

d- 2 - Develop skills related to creative and critical thinking as well as problem solving (d12)

4- Course Contents

No.	Topics	No of Hours
1	Fundamental of signals.	4
2	Continuous-time and discrete-time signals, signal energy and power, some basic operations.	4
3	Exponential and sinusoidal signals, some elementary signals.	4
4	Fourier-series representation of continuous-time periodic signals and its properties.	4
5	Fourier-series representation of discrete-time periodic signals and its properties.	4
6	The continuous-time Fourier transform.	4
7	The continuous-time Fourier transform properties.	4
8	The Frequency Response of Continuous-Time LTI Systems	4
9	Sampling and Spectrum analysis.	4
10	Quantization	4
11	Encoding	4
12	Energy and power spectra.	4

5- Teaching and Learning Methods

5.1- Modified Lectures

5.2- Class activity

5.3- workshop

5.4- Seminar

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 and intellectual skills.
4	Oral exam to assess knowledge, intellectual, professional and general skills
5	Final exam to assess knowledge and intellectual skills.

b- Assessment Schedule

No.	Assessment	Week
1	Assignments	4,6,7,9,10,13
2	Quizzes	5,12
3	Mid-term exam	8
4	Oral Exam	14
5	Final exam	15

c- Weighting of Assessments

Assessment	Weight
Mid-term Examination	20 %
Final Term Examination	60 %
Oral Examination	20 %
Practical Examination	0 %
Semester work	0 %
Other types of assessment	0 %
Total	100 %

8- List of References

a- Course Notes

- 1- Course Notes

b- Books

- 1- Alan V.Oppenheim, Alan S.Wilsky, Signals and systems, 2nd edition, Prentice Hall, 1997
- 2- Simon Haykin, Barry Van Veen, Signals and systems, 2nd edition, Wiley India Pvt. Limited, 2007

c- Recommended Books

- 1- James H. McClellan, Ronald W. Schafer, Mark A.Yoder, DSP first: a multimedia approach, Prentice Hall, 1998

d- Periodical

- 1- Math works

- Course Instructor : **Dr. Abdallah Hammad Dr. Mostafa fouda**

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



Faculty of
Engineering at
Shoubra

Model No.11A Course Specifications : Signal Analysis

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	Fundamental of signals	1	a1			
2	Continuous-time and discrete-time signals, signal energy and power, some basic operations.	2	a1, a2	b1	c1	
3	Exponential and sinusoidal signals, some elementary signals	3	a1	b1,b2	c1	
4	Fourier-series representation of continuous-time periodic signals and its properties	4	a3	b1	c2	
5	The continuous-time Fourier transform	5	a3	b2	c2	d1,d2
6	The continuous-time Fourier transform properties	6	a3	b1,b3	c2,c3	
7	The Frequency Response of Continuous-Time LTI Systems	7	a1,a3	b2, b3	c1,c3	
8	Midterm	8	a1, a2,a3	b1,b2		d2
9	Quantization	10	a4	b2	c2	
10	Encoding	11	a2, a4	b2	c2,c3	
11	Sampling and Spectrum analysis	12	a2, a3, a4	b2	c1,c2	d1,d2
12	Energy and power spectra	13	a5	b2,b3	c1,c3	
13	Oral exam	14	a3, a4	b3	c3	d1,d2
14	Final exam	15	a1,a2,a3,a4,a5	b1,b2,b3		d2

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

- **Course Instructor** : Dr. Abdallah Hammad Dr. Mostafa fouda

Matrix of course content and ILO's

Course Title: Signal Analysis **Code:** ECE221 **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: N.A.

Department offering the program: Electrical Engineering Department

Department offering the course: Electrical Engineering Department

Academic year / level: **2014-2015 Second Year / second semester**

Date of specifications approval: 20/6/2010

Course contents	a1	a2	a3	a4	a5	b1	b2	b3	c1	c2	c3	d1	d2
Fundamental of signals.	✓												
Continuous-time and discrete-time signals, signal energy and power, some basic operations.	✓	✓				✓			✓				
Exponential and sinusoidal signals, some elementary signals.	✓					✓	✓		✓				
Fourier-series representation of continuous-time periodic signals and its properties.			✓			✓				✓			
Fourier-series representation of discrete-time periodic signals and its properties.				✓		✓	✓			✓			
The continuous-time Fourier transform.			✓				✓			✓		✓	✓
The continuous-time Fourier transforms properties.			✓			✓		✓		✓	✓		
The Frequency Response of Continuous-Time LTI Systems	✓		✓				✓	✓	✓		✓		
Sampling and Spectrum analysis.				✓			✓			✓			
Quantization		✓		✓			✓			✓	✓		
Encoding		✓	✓	✓			✓		✓	✓		✓	✓
Energy and power spectra.					✓		✓	✓	✓		✓		

Matrix of course aims and ILO's

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Course aims	a1	a2	a3	a4	a5	b1	b2	b3	c1	c2	c3	d1	d2
Represent continuous-time and discrete-time signals in both time and frequency domains.	✓	✓				✓	✓		✓				
analyze signals using Fourier series, Fourier transform (continuous and discrete).	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Represent CT signals by its samples and analyze the spectrum.		✓	✓	✓			✓		✓	✓		✓	✓
Completely understand energy and power spectrum.					✓		✓	✓	✓		✓		

Course Instructor: **Dr. Abdallah Hammad Dr. Mostafa Fouda**

Head of department: **Prof. Dr. Sayed Abo-Elsood Ward**

Date: / /