



Faculty of
Engineering at
Shoubra

Model No.12
Course Specifications : Test 3b
2014 - 2015

University : Benha university

Faculty : Faculty of Engineering

At Shoubra

Department : Electrical Engineering Department

1- Course Data

Course Code : ECE 324 Course Title : Test 3b Study Year : Third Year

Specialization :

Teaching Hours:

Lecture :

Tutorial :

Practical : 4

2- Course Aim

For students undertaking this course, the aims are to:

2.1 – Demonstrate the analog and digital modulation techniques.

2.2- Demonstrate the operation of Operational amplifiers circuits, oscillators

2.3- Demonstrate the operation of Voltage-controlled Oscillator (VCO) and Phase locked loop (PLL)

3- Intended Learning Outcomes of Course (ILOS)

a- Knowledge and Understanding

On completing this course, students will be able to:

a-1 – Describe Principles of design including elements design, process and system related to analog and digital modulators .(a5)

a-2- Explain principles of analyzing and design of electronic circuits and components. (a19)

a-3 – Describe Principles of design including elements design, process and/or a system related to Operational amplifiers, Oscillators and active filters.(a5)

b- Intellectual Skills

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

- b-1– Synthesize and merge electronic analog and digital systems for certain function using Operational amplifiers and BJT.(b18)
- b-2- Evaluate the characteristics and performance of analog and digital components, systems and processes. (b6)

c- Professional Skills

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

- c-1 - Create and re-design digital component or system, and carry out specialized engineering designs related to Amplitude and frequency shift key.(c3)
- c-2 - Use relevant laboratory analog and digital devices such as Twin-T Oscillators and study the correct results.(c16)

d- General Skills

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

- d-1 - Collaborate effectively within multidisciplinary team. (d1)
- d-2– Share ideas and communicate with others according to the rules of professional ethics.(d11)

4- Course Contents

No.	Topics	No of hour
1	Double sideband (DSB) modulation and demodulation	4
2	Single sideband (SSB) modulation and demodulation	4
3	FM modulation and demodulation	4
4	PCM encoding and decoding	4
5	Amplitude shift keying (ASK)	4
6	Frequency shift keying (FSK)	4
7	Phase shift oscillator using Operational amplifiers and BJT	4
8	Wien-Bridge oscillators	4
9	Twin-T Oscillators	4
10	Saw tooth (Ramp) generator	4
11	Voltage-Controlled Oscillators	4
12	Phase-Locked Loop (PLL)	4

- 5.1- Practical training / laboratory
- 5.2- Class activity
- 5.3- Assignments / homework

6- Teaching and Learning Methods of Disables

6.1- laboratory instruments

7- Student Assessment

a- Student Assessment Methods

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

b- Assessment Schedule

No.	Assessment	Week
1	Assessment 1 on	all
3	Mid-term exam on	8
4	Oral Exam on	14
5	Final exam on	15

c- Weighting of Assessments

Assessment	Weight
Mid_Term Examination	20 %
Final_Term Examination	50 %
Oral Examination	20 %
Practical Examination	0 %
Semester work	10 %
Other types of assessment	0 %
Total	100 %

8- List of References

a- Books

1- Malvino,Laboratory Manual

Course Coordinator : Assoc. Prof. Dr. Mohamed TarekElewa

Course Instructor : Dr. RokaiaMounirZaki

Dr. BasemMamdohHagagElHalawany

- Head of Department : Prof. Dr. SayedAbu-Elsood Ward



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Matrix of Knowledge and Skills of the course

No.	Topics	week	Basic Knowledge	Intellectual Skills	Professional Skills	General Skills
1	Double sideband (DSB) modulation and demodulation	1	a1	b1	c1, c2	d1, d2
2	Single sideband (SSB) modulation and demodulation	2	a1,a2	b1	c1, c2	d1, d2
3	FM modulation	3	a1	b1	c1, c2	d1, d2
4	FM demodulation	4	a1,a2	b1	c1, c2	d1, d2
5	PCM encoding and decoding	5	a1,a2	b1	c1, c2	d1, d2
6	Amplitude shift keying (ASK)	6	a2	b1	c1, c2	d1, d2
7	Frequency shift keying (FSK)	7	a1,a2	b1	c1, c2	d1, d2
8	Mid term exam	8	a1,a2	b1		
9	Phase shift oscillator using Operational amplifiers and BJT	9	a2,a3	b1, b2	c1, c2	d1, d2
10	Wien-Bridge oscillators	10	a2,a3	b1, b2	c1, c2	d1, d2
11	Twin-T Oscillators	11	a2,a3	b1	c1, c2	d1, d2
12	Saw tooth (Ramp) generator	12	a2	b1, b2	c1, c2	d1, d2
13	Voltage-Controlled Oscillators and Phase-Locked Loop (PLL)	13	a2	b1	c1, c2	d1, d2
14	Oral Exam	14	a2	b1	c1, c2	
15	Final exam	15	a2	b1, b2		

Matrix of course content and ILO's

Course Title: Test3b

Code: ECE324

Lecture:-

Tutorial:-

Practical: 4

Total: 4

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: **Third Year / Second Semester 2014 -2015**

Date of specifications approval: 20/6/2010

Course content	a1	a2	a3	b1	b2	c1	c2	d1	d2
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Double sideband (DSB) modulation and demodulation	✓			✓		✓	✓	✓	✓
Single sideband (DSB) modulation and demodulation	✓	✓		✓		✓	✓	✓	✓
FM modulation and demodulation	✓	✓		✓		✓	✓	✓	✓
PCM encoding and decoding	✓	✓		✓		✓	✓	✓	✓
Amplitude shift keying (ASK)		✓		✓		✓	✓	✓	✓
Frequency shift keying (FSK)	✓	✓		✓		✓	✓	✓	✓
phase shift oscillator using Operational amplifiers and BJT	✓		✓	✓	✓		✓	✓	✓
Wien-Bridge oscillators	✓		✓	✓	✓		✓	✓	✓
Twin-T Oscillators	✓		✓	✓			✓	✓	✓
Saw tooth (Ramp) generator	✓			✓			✓	✓	✓
Voltage-Controlled Oscillators and Phase-Locked Loop (PLL)	✓			✓			✓	✓	✓

Matrix of course aims and ILO's

Course Title: Test3b

Code: ECE324

Lecture:-

Tutorial:-

Practical: 4

Total:4

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

Major or minor element of program: Major

Department offering the program: ElectricalEngineering Department

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Academic year / level: **Third Year / SecondSemester** 2014 -2015

Date of specifications approval: 20/6/2010

Course aims	a1	a2	a3	b1	b2	c1	c2	d1	d2
Demonstrate the analog and digital modulation techniques.	✓	✓		✓		✓	✓	✓	✓
Understand the operation of Operational amplifiers circuits, Oscillators, VCO, and PLL	✓	✓	✓	✓	✓	✓	✓	✓	✓

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