Faculty of Engineering
at shoubra

Model No.12
Course Specifications : Electronic Circuits 3A

University : Benha university

Faculty : Faculty of Engineering at shoubra

Department : Electrical Engineering Department

1- Course Data

Course Code : ECE312 | Course Title : Electronic Circuits 3A | Study Year : Third 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- Explain the basic transistor biasing techniques.
2.2- Explain how transistor are modeled with re and hybrid parameters and small signal analysis.
2.3- Analysis of the transistor circuits at low, medium and high frequencies using bode plots and frequency response.
2.4- Explain the operation of harmonic oscillators, tuned amplifiers, power amplifiers,mixers and modulators.

3- Intended Learning Outcomes of Course (ILOS)

a- Knowledge and Understanding

On completing this course, students will be able to:

a-1- Define concepts of the basic transistor biasing techniques in electronic circuits. (a1)
a-2- Define concepts of transistor modeling with re and hybrid parameters and small signal analysismodels.(a2)
a-3 -Describe principles of analyzing and design of the transistor circuits at low, medium and high frequencies using bode plots and frequency response. (a19)
a- 4 - Describe principles of design including elements design, process and/or the operation of harmonic oscillators, tuned amplifiers, power amplifiers, Mixers and modulators. (a5)
a- 5 - Illustrate elementary science underlying power amplifiers. (a15)

b- Intellectual Skills

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

b- 1- Think in a creative and innovative way in problem solving and design of BJT transistor circuits. (b4)
b- 2 - Plan, conduct and write a report on an amplifier project. (b15)
b- 3 - Synthesize and integrate electronic systems for the electronic circuits using the correct equipment. (b18)

c- Professional Skills

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

c- 1 - Create and re-design certain type of amplifiers and carry out specialized engineering designs. (c3)
c- 2 - Use computational facilities and techniques, measuring instruments, workshops and electronic laboratories equipment to design, analyze, and interpret results for the circuits. (c5)
c- 3 - Troubleshoot, maintain and repair the electronic project using the standard tools related to electronic circuits. (c17)

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)

d- 2- Communicate effectively. (d3)

4- Course Contents

No.	Topics	No of hours
1	DC Biasing BJTs	4
2	Transistor hybrid parameters	4
3	BJT transistor modeling	4
4	BJT small signal analysis	4
5	BJT frequency response (low frequency response)	4
6	BJT frequency response (high frequency response)	4
7	Bode-Plot and frequency response	4
8	Power amplifiers	4
9	Tuned amplifiers	4
10	Harmonic Oscillators	4
11	Modulation circuits	4
12	Mixer circuits	4

5- Teaching and Learning Methods

5.1-modified Lectures
5.2- Practical training
5.3- Class activity
5.4- Assignments

6- Teaching and Learning Methods of Disables

Nothing

7- Student Assessment

a- Student Assessment Methods

1	Assessment to assess knowledge and intellectual skills.
2	Quizzes to assess knowledge, intellectual.
3	Mid-term exam to assess knowledge, intellectual
4	Oral Exam to assess knowledge and intellectual skills professional and general skills.
5	Practical Examination of some individual and group projects.
6	Final exam to assess knowledge, intellectual.

b- Assessment Schedule

No.	Assessment	Week
1	Assessments	3, 7, 11, 13
2	Assessment 2 Quizzes	4, 6, 10, 12
3	Assessment 3 Mid-term exam	8
4	Assessment 4 Oral Exam	14
5	Assessment 5 Final exam	15

c- Weighting of Assessments

Assessment	Weight
Mid_Term Examination	10 %
Final_Term Examination	60 %
Oral Examination	10 %

Practical Examination	10 %
Semester work	5 %
Other types of assessment	5 %
Total	100 %

8- List of References

a- Course Notes

1- Course notes prepared by instructor.

b- Books

1- Robert L. Boylestad, Electronic devices and circuit theory, 11th Edition , Prentice hall,2001

c- Recommended Books

1- Thomas L. Floyd, Electronic devices, 9th Edition, Pearson Education, Limited, 2005

Course Instructor:

- Course Coordinator : Dr. Ahmad AbdelAziz El-Banna

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

Faculty of Engineering at shoubra

Model No.11A
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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 S
1	DC Biasing BJTs	1	a1		
2	Transistor hybrid parameters	2	a2		c2
3	BJT transistor re modeling	3	a1, a2	b1,b2	c1
4	BJT transistor hybrid model	4	a1, a2		c1
5	BJT small signal analysis	5	a2	b1	c2
6	BJT frequency response (low frequency response)	6	a1, a3	b2	c1,c2
7	Mid term exam	7	a1, a2, a3	b1	
8	BJT frequency response (high frequency response)	8	a1, a3	b1	c1,c2
9	Bode-Plot and frequency response	9	a3	b1	c3
10	Tuned amplifiers and Power amplifiers	10	a4,a5	b2, b3	c1
11	Harmonic Oscillators	11	a2, a5	b1	c1, c2,c3
12	Modulation circuits	12	a4,a5	b2, b3	c1
13	Mixer circuits	13	a4	b3	c1,c2
14	Oral exam	14	a1, a4, a5	b1,b2,b3	c1, c2,c3
15	Final exam	15	a1, a2, a3,a4	b1	

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Matrix of course content and ILO's

Course Title: Electronic Circuits 3A **Code**: ECE312
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: **Third** Year / **First** Semester 2014/2015
Date of specifications approval: 20/6/2010

Course content	a1	a2	a3	a4	a5	b1	b2	b3	c1	c2	c3	d1	d2
DC Biasing BJTs	✓												
Transistor hybrid parameters		✓								✓			
BJT transistor modeling	✓		✓		✓	✓	✓		✓	✓	✓		
BJT small signal analysis		✓				✓				✓			
BJT frequency response (low frequency response)	✓		✓				✓		✓	✓			
BJT frequency response (high frequency response)	✓		✓			✓			✓	✓			
Bode-Plot and frequency response			✓			✓					✓		
Harmonic Oscillators		✓			✓	✓			✓	✓	✓		
Tuned amplifiers and Power amplifiers				✓	✓		✓	✓	✓				
Modulation circuits				✓	✓		✓	✓	✓				
Mixer circuits				✓				✓	✓	✓			

Matrix of course aims and ILO's

Course Title: Electronic Circuits 3A **Code**: ECE312
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Course aims	**a1**	**a2**	**a3**	**a4**	**a5**	**b1**	**b2**	**b3**	**c1**	**c2**	**c3**	**d1**	**d**
Explain the basic transistor biasing.	✓												
Explain how transistor are modeled with re and hybrid parameters.	✓	✓	✓		✓	✓	✓		✓	✓	✓		
Analysis of the transistor circuits at low, medium and high frequencies using bode plots and frequency response.	✓		✓			✓	✓		✓	✓	✓		
Explain the operation of harmonic oscillators, tuned amplifiers, power amplifiers, Mixers and modulators.		✓		✓	✓	✓	✓	✓	✓	✓	✓		

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