



Faculty of
Engineering at
Shoubra

Model No.12

Course Specifications : Electrical and Electronic Measurements

University : Benha university

Faculty : Faculty of Engineering at Shoubra

Department : Electrical Engineering Department

1- Course Data

Course Code : ECE 211	Course Title : Electrical and Electronic Measurements	Study Year : Second Year
Specialization :		
Teaching Hours:		
Lecture : 4	Tutorial : 2	Practical :

2- Course Aim

For students undertaking this course, the aims are to:

- 2.1- Evaluate the basic concepts of electrical measurements
- 2.2- Demonstrate the different basic measuring instruments; digital instruments, oscilloscopes, graphical instruments, and Electromechanical instruments.
- 2.3- Discuss the basic types of signal generators.

3- Intended Learning Outcomes of Course (ILOS)

a- Knowledge and Understanding

- a1- Define concepts of electrical measurements , appropriate to oscilloscopes, graphical instruments, and Electromechanical instruments..[a2]
- a2- Demonstrate characteristics of engineering materials related to oscillators and signal generators. [a4]
- a3- Describe principles of analog measuring instrument design.[a5]
- a4- Describe principles of analyzing and design of digital electronic circuits.[a19]

b- Intellectual Skills

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

- b1 -Think in a creative and innovative way in solving and design of different analog electronic circuits. [b4]
- b2 -Combine, exchange, and assess different ideas, views, and knowledge from a range of sources to design analog and digital voltmeters .[b5]
- b3- Synthesize and integrate electronic systems for voltage and current measurements using the right equipment.[b18]

c- Professional Skills

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

- c1 - Use oscilloscope and multimeters to measure system performance. [c19]

d- General Skills

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

- d1- Communicate effectively.[d3]
- d2- Refer to relevant literatures.[d9]

4- Course Contents

No.	Topics	No of hours
1	Units, Dimensions and standards	4
2	Measurements errors	4
3	Electromechanical instruments	4
4	Electrodynamics instruments	4
5	Digital Instruments Basics-DAC-ADC	4
6	Digital Voltage Measurements	4
7	Digital frequency measurements	4
8	CRT , Sweep Generators	4
9	Triggering-Distortion- Pulse measurements	4
10	Graphical instruments-Printers-Plotters	4
11	LF function Generators	4
12	RF Oscillators	4
13	Sensors and Transducers	4

5- Teaching and Learning Methods

- 5.1- Modified Lectures
- 5.2- Class activity
- 5.3- Assignments / homework

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 and intellectual, professional and general skills.
5	Final exam to assess Knowledge and intellectual skills.

b- Assessment Schedule

No.	Assessment	Week
1	Assessment 1 on	2, 5, 9, 11
2	Quizzes on	4, 10
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	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- Recommended Books

- 1- David A. Bell, "Electronic Instrumentation and Measurements" 1994
- 2- Ian Hickman, "Digital Storage Oscilloscopes", 1997
- 3- Waldemar Nawrocki, "Measurement Systems and Sensors", 2005

- Course Instructor :

1 – Assoc. Prof. Dr. Mohamed Tarek Elewa

2 – Dr. Ibtesam Omar Bakhit Said

3 - Basem Mamdoh Hagag Elhalawany

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



Shoubra
Faculty of
Engineering

Model No.11A Course Specifications : Electrical and Electronic Measurements

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Department : Electrical Engineering Department

Matrix of Knowledge and Skills of the course

No .	Topics	week	Basic Knowledge	Intellectual Skills	Professional Skills	General Skills
1	Units, Dimensions and Standards	1	a1,a2,a3,a4	b1,b2		d2
2	Measurements Errors	2	a1,a2,a3,a4	b1,b2		d2
3	Electromechanical Instruments	3	a1,a3	b1	c1	d1,d2
4	Electrodynamics Instruments	4	a1,a3	b1	c1	d1,d2
5	Digital Instruments Basics	5	a4	b2	c1	d1,d2
6	Digital voltage measurements	6	a4	b2,b3	c1	d1,d2
7	Digital Frequency Measurements	7	a4	b2,b3	c1	d1,d2
8	Midterm Exam	8	a1,a2,a3,a4	b1, b2,b3		
9	LF function Generators	9	a2,a3	b1,b3	c1	d1,d2
10	RF Oscillators	10	a2,a3	b1,b3	c1	d1,d2
11	Sensors and Transducers	11	a1,a2	b2		d2
12	CRT-Sweep Generator	12	a1,a3	b1,b3		d1,d2
13	Triggering -Distortion-Pulse Measurements	12	a1,a3	b1,b3	c1	d1,d2
14	Graphical instruments	13	a1,a3,a4	b1, b2,b3	c1	d1,d2
15	Oral Exam	14	a1,a2,a3,a4	b1, b2, b3		
16	Final exam	15	a1,a2,a3,a4	b1, b2, b3		

- 1 - Assoc. Prof. Dr. Mohamed Tarek Elewa
- 2 – Dr. Ibtesam Omar Bakhit Said
- 3- Dr. Basem Mamdooh Hagag El Halawany

Matrix of course content and ILO's

Course Title: Electrical and Electronic Measurements **Code:** ECE 211
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: Second Year / First Semester
Date of specifications approval: 20/6/2010

Course Content	a1	a2	a3	a4	b1	b2	b3	c1	d1	d2
Units, Dimensions and Standards- Measurements Errors	✓	✓	✓	✓	✓	✓				✓
Electromechanical Instruments- Electrodynamics Instruments	✓		✓		✓			✓	✓	✓
Digital Instruments Basics				✓		✓		✓	✓	✓
Digital voltage measurements- Digital Frequency Measurements				✓		✓	✓	✓	✓	✓
CRT-Sweep Generator	✓		✓		✓		✓	✓	✓	✓
Triggering -Distortion-Pulse Measurements	✓		✓		✓		✓	✓	✓	✓
Graphical instruments	✓		✓	✓	✓	✓	✓	✓	✓	✓
LF function Generators		✓	✓		✓		✓	✓	✓	✓
RF Oscillators		✓	✓		✓		✓	✓	✓	✓
Sensors and Transducers	✓	✓				✓				✓

Matrix of course aims and ILO's

Course Title Electrical and Electronic Measurements **Code:** ECE 211
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Course aims	a1	a2	a3	a4	b1	b2	b3	c1	d1	d2
Evaluate the basic concepts of electrical measurements	✓	✓			✓			✓		
Demonstrate the different basic measuring instruments; digital instruments, oscilloscopes, graphical instruments, and Electromechanical instruments.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Discuss the basic types of signal generators		✓	✓		✓		✓	✓	✓	✓

- **Course Coordinator:** Ass. Prof. Dr. Mohamed TarekElewa

- **Course Instructor :**

1 - Assoc. Prof. Dr. Mohamed TarekElewa

2 – Dr. Ibtesam Omar Bakhit Said

3- Dr. BasemMamdohhagagElHalawany

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