

Palestine Technical University - Kadoorie
جامعة فلسطين التقنية - خضوري

Electrical Engineering Department

Electronics Lab

**Exp (0):
Introduction to Electronics Lab**

Presentation By:
Mr. Tareq Foqha


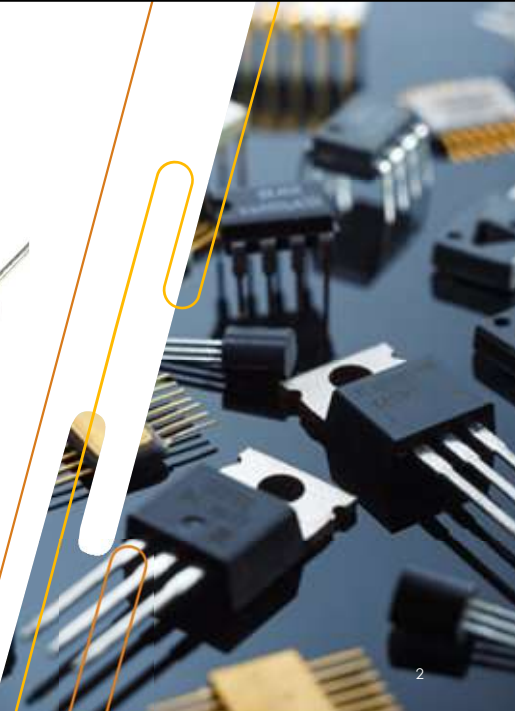
Summer 2023-2024

What will be covered in this Lab?

The main objective of this lab is to directly apply the theoretical concepts learned in lectures to practical experiments with laboratory devices.

Electronic Devices

01. PN Diodes
02. Zener Diodes
03. LEDs
04. BJT
05. Applications of each

Experiments will be covered in this lab:

Topic 1: Introduction to Electronics Lab

- Exp(0): Introduction to Electronics Lab

Topic 2: PN Diode

- Exp(1): Effect of the P-N Junction in Diodes / Characteristic Curves for Diodes of Different Semiconductor Materials
- Exp(2): Diode Applications (Rectifiers)

Topic 3: Zener Diode

- Exp(3): Zener Diodes Characteristics and DC Voltage Limiter Zener
- Exp(4): Connection of Zener diodes, AC Voltage Limiter Zener and Voltage Stabilization with Zener Diodes

3

Experiments will be covered in this lab:

Topic 4: Special Diodes

- Exp(5): Characteristics of an LED

Topic 5: Bipolar Transistors

- Exp(6): Examine the effect of the p-n junctions of a transistor on the current flowing through it, in relation to the applied voltage and its polarity.
- Exp(7): Current Distribution in the Transistor and Control Effect of the Base Current
- Exp(8): Characteristics of the Transistor
- Exp(9): BJT Amplifiers

4

Course Assessment

Midterm Exam

30 marks

Course Works

30 marks

Final Exam

40 marks

5

What about the reports?



Palestine Technical University - Kadoorie
جامعة فلسطين التقنية - خفوري

Faculty of Engineering and Technology

Electrical Engineering Department

Electronics Lab (12120206)

Experiment Name: Diode Applications - Rectifiers	Experiment Number: (1)
Semester and Year: Summer Semester 2023/2024	
Name of Students and Uni. Numbers: Ahmad Mohammad (201810105) Ahmad Mohammad (201810105) Ahmad Mohammad (201810105) Ahmad Mohammad (201810105)	
Experiment Conducted on: 01/08/2024	Report Submitted on: 08/08/2024
Submitted For: Mr. Tareq Foqha	

Criteria	Grades	Student grade
Report elements	2	
Writing skills	3	
Measurements	2	
Analysis & Drawings	3	
Total	10	

Objectives

Introduction

Theoretical Background

Experiment Procedures/Methodology

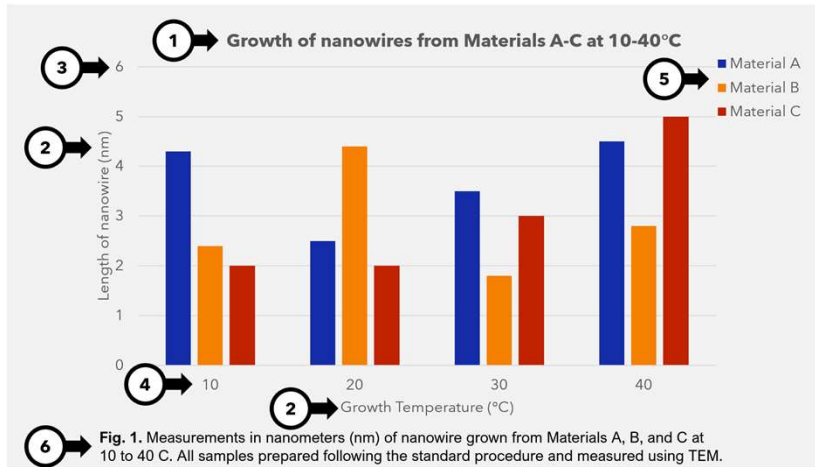
Results and Discussion

Conclusion

6

What about the reports?

Figures



7

What about the reports?

Tables

Tables are labelled above the table

Units are given in the column headings

Table 1. Circular cylinder data

Rotation angle (°)	Voltage (V)	Delta P (kPa)	C_p
0	0.9654	383.44	0.6411
15	0.6629	243.26	0.4293
30	0.0365	11.76	0.0212

8

Report assessment criteria

Criteria	Grades	Student grade
Report elements	2	
Writing skills	3	
Measurements	2	
Analysis & Drawings	3	
Total	10	

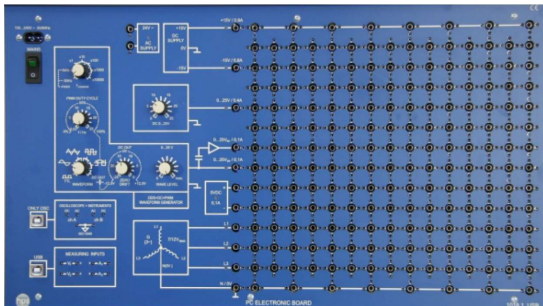
Can I use ChatGPT?

Late Submission!!

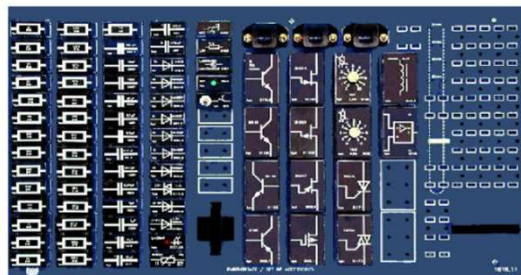
Simulation Software...

9

Main components of the Lab



Electronic Kit



Set of Accessories
(Type 1018.11)
incl. Storage board

Main components of the Lab



DC Source

Function Generator



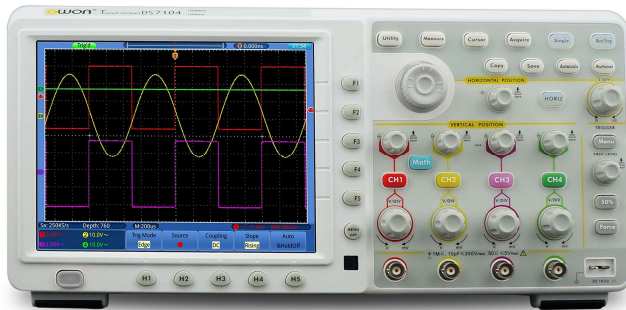
Main components of the Lab



AC/DC Multimeter



Main components of the Lab



4 Channels Touch Screen Digital Oscilloscope

13

Practical Part: Some Basics

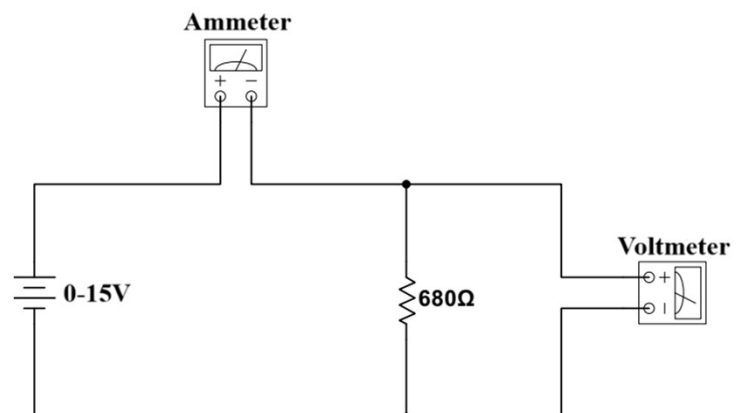
Part 1: DC Measurements

To become familiarized with the use of DC Power Supply and the Digital Multimeter for measuring DC voltage and DC current.

Equipment:

- Breadboard
- DC power supply
- Digital multimeter
- Resistor (680)

V _{source}	V _R	I _R
4		
7		
9		
12		



Practical Part: Some Basics

Part 2: AC Measurements

To become familiarized with the use of AC Power Supply, DMM, and the Oscilloscope for measuring AC quantities (Voltage, current, frequency, phase shift).

Equipment:

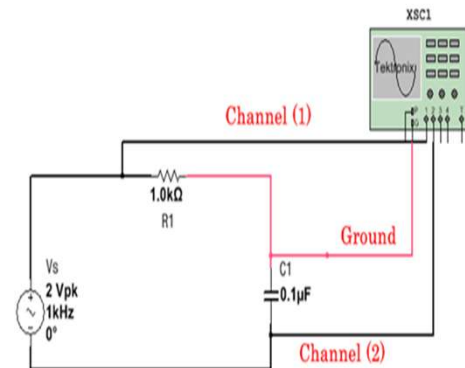
- Breadboard
- AC power supply
- Oscilloscope and DMM
- Resistor
- Capacitor

Measure the followings using Oscilloscope:

- Source RMS voltage
- Source RMS current
- Source peak to peak voltage
- Source frequency
- Phase shift between I and V signals

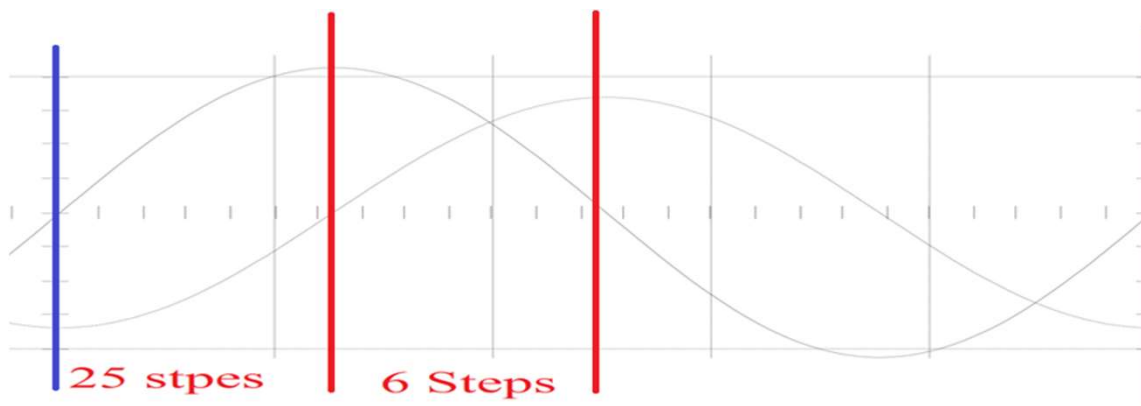
Measure the followings using DMM:

- Source RMS voltage
- Source RMS current



Practical Part: Some Basics

Method 1: Phase shift measurement



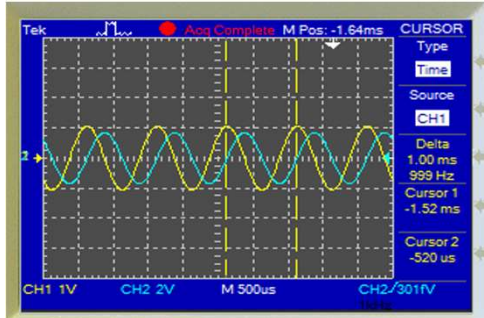
$$25 \text{ steps} \rightarrow 360$$

$$6 \text{ steps} \rightarrow x$$

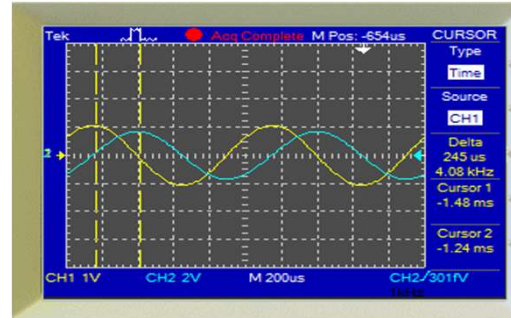
$$x = 86.4$$

Practical Part: Some Basics

Method 2: Phase shift measurement



Period (T) = 1ms



difference (Δt) = 245 μ s

$$\text{Phase Shift} = \frac{\Delta t}{T} * 360$$

$$\text{Phase Shift} = \frac{0.245}{1} * 360$$

$$\text{Phase Shift} = 88.2$$