

**PHYS 102L: General Physics II Laboratory, Spring 2023**

**KOÇ UNIVERSITY**

College of Sciences

**COURSE INFORMATION**

<b>Instructor</b>	Nazmi Yılmaz (Sci 136), Ext: 1726, nayilmaz@ku.edu.tr
<b>Laboratory Assistants</b>	TBA
<b>First Laboratory</b>	<b>March 13, 2023</b>
<b>Office Hours</b>	Laboratory Instructor (Coordinator): Mondays 14:00-15:00; and by appointment in SCI 136. Teaching Assistants: TBA
<b>Required Materials</b>	* <i>Experiment Handouts and Lab report question sheets</i> will be shared on the <a href="#">Blackboard</a> platform. Access to <a href="#">Masteringphysics</a> through The <a href="#">Blackboard</a> platform needed for the experiment simulations. * <i>General Physics II Labbook (Hardcopy will available in Copycenter by April), Graph Paper Notebook, Non-programmable calculator, Ruler, Protractor</i>
<b>Prerequisites</b>	N/A
<b>Grading</b>	Exp1: 15%, Exp2-6: 5x17%, Project Bonus: 10%

		<b>Spring 2023 Tentative Laboratory Schedule General Physics II Laboratory/PHYS 102 Lab</b>	
		<b>Laboratory Sections: 1,3,5,7,9,11,13,15,17,19,21,23,25,27</b>	<b>Laboratory Sections: 2,4,6,8,10,12,14,16,18,20,22,24,26,28,29</b>
Week1	Feb.27	No Lab	
Week2	Mar.06	No Lab	
Week3	Mar.13	<b>Exp1: Electric Field Lines</b>	
Week4	Mar.20	No Lab	
Week5	Mar.27	<b>Exp2: Capacitors</b>	
Week6	Apr.03	No Lab	
Week7	Apr.10	<b>Exp.3: Kirchoff's Laws</b>	
<b>Week8</b>	<b>Apr.17</b>	<b>Spring Break</b>	
Week9	Apr.24	<b>Exp4: RC Circuits</b>	No Lab
Week10	May.01	No Lab	<b>Exp4: RC Circuits</b>
Week11	May.08	<b>Exp5: Lorentz Force</b>	No Lab
Week12	May.15	No Lab	<b>Exp5: Lorentz Force</b>
Week13	May.22	<b>Exp6: RL Circuits</b>	No Lab
Week14	May.29	No Lab	<b>Exp6: RL Circuits</b>
<b>Jun05-10</b>		<b>Make up Labs</b>	
<b>Due Date: Jun15</b>		<b>Project Bonus: Building an Electric Motor</b>	

## Phys102 Laboratory Course Outline

### Experiment1: Electric Field Lines

The aim of this experiment is to investigate the electric field lines for a uniform electric field and equipotential surfaces surrounding a two dimensional charged conductor.

Two point charges, one point charge and a parallel plate, two parallel plates and concentric placed two rings will be used as the charged conductors.

### Experiment2: Capacitors

In this experiment, students will explore the relationship between capacitance, plate separation and plate area. The variables that affect the capacitance of the parallel plate capacitor will be identified. The energy stored on the capacitor will be measured and analyzed.

### Experiment3: Kirchhoff's Laws

The purpose of this experiment is to discover the laws governing resistance, voltage and current in circuits, investigate Kirchhoff's Laws.

### Experiment5: RC Circuits

The purpose of this experiment is to investigate the response to an abrupt of simple RC circuit, calculate the time constant and determine capacitance.

### Experiment5: Lorentz Force

Our aim in this experiment is to investigate the force exerted on a current carrying conductor inside a magnetic field when the magnetic field strength and length of the wire inside the magnetic field are varied.

### Experiment6: RL Circuits

The purpose of this experiment is to investigate the response to an abrupt of simple RL circuit, calculate the time constant and determine inductance.

### Project Bonus: Building an Electric Motor

Students will build an electric motor from scratch and present their work in a short video clip, demonstrating the motor in action, with a measurement of its rpm, describing the parts and explaining the working principle of the motor.

## Phys102 Laboratory Course Learning Objectives

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

Apply the physics concepts taught in General Physics II course in related experimental settings.

Collect experimental data and share experimentation responsibility (rotate rules, give constructive feedback) with other group members.

Determine how to measure data and how to reduce sources of error in experiments.

Make predictions about outcome of measurements and experimental results.

Calculate percent error and standard error to evaluate the experimental results.

Plot and analyze graphs on scientific graph paper and apply linear regression method to find the line of best fit.

Justify varying experimental results by giving plausible explanations.

Prepare a lab report to describe the experimental process and summarize the experimental results.

## LABORATORY RULES

### Attendance

Attendance at all laboratory sessions is mandatory. Biweekly Laboratory sessions will be conducted via the zoom link on the [Blackboard](#) platform until face-to-face education commences. Students are eligible for makeup laboratory sessions only by having a medical report approved by Koç University Health Center or an excuse form approved by the Dean of Students covering the missed laboratory date.

### Withdrawal from Phys102L

- Withdrawing from the Phys102 course does not mean a consequent withdrawal from the Phys102Lab course. Students need to withdraw from the Phys102lab course separately from the Phys102 course. This only applies to withdrawal, not to add-drop.

### Online Experiments

- There will be zoom meetings during Laboratory hours when the Lab Instructor will discuss the theory and procedure of the experiments with the students. The online Experiment Link, the Experiment Manual and the Lab DataSheet and Lab ReportSheet will be shared, and the deadline for submitting the Lab Report will be set.
- Students must perform the online experiment, fill in the lab datasheet during the lab hour, write the report and submit it to Blackboard before the due date.

### Laboratory Report

- Students must write the lab reports individually. There will be no group work.
- The lab report must be typewritten on the PC. We request graphs to be plotted by hand on graph paper.
- The lab report must be uploaded to the Backboard.
- The lab report must include the Semester, Course, Date, ID number, laboratory section and the laboratory instructor of the student.
- Plagiarism checks will be used in Lab report evaluations.
- Due date extensions are only given for exceptional cases the lab instructor acknowledges. Points will be deducted from late Lab reports.
- Use the same font size and same format throughout the Lab report.
- Use formal language and passive voice.
- Use clean, structured language so that the answers can be quickly followed.

### Physics Laboratory Safety Rules

- Koç University emergency dial 1122.
  - Wear face mask in the laboratory at all times.
  - Maintain a safe distance when working in the laboratory.
  - Sanitize your hands upon entering and leaving the laboratory.
1. Physics Laboratory equipment include metal, plastic, wood, glass hardware, rotating/moving machinery, electrical, electronic devices. If not properly used, the equipment may cause an accident, fire, explosion, resulting in injuries ranging from minor to lethal.
  2. Always wear appropriate clothing during the laboratory session. Hair, clothing parts or jewelry may get caught in the equipment, causing injury.
  3. Eating, drinking or smoking in the laboratory is prohibited.

4. Follow the instructor's announcements at all times.
5. If instructed, wear protective equipment (gloves, goggles) during the experiment. Protective equipment will be supplied in the laboratory.
6. Inspect the equipment carefully before setup against broken, malfunctioning parts. If there is any problem, inform the lab instructor immediately.
7. Any electrical device must be used in the following sequence:
  - a. BEFORE PLUG IN:
    - i. Inspect the outlet cable and its ends against wear and tear.
    - ii. Make sure the device is not connected to anything else.
    - iii. Make sure the main switch of the device is at "OFF" position.
  - b. BEFORE TURN ON: Make sure that output/adjustment knobs of the device are all at off or minimum position.
  - c. Turn on the device and check that it operates properly.
  - d. Turn off and make the necessary connections to the device in the setup.
  - e. Turn on and use the device.
  - f. Set all the output/adjustment knobs of the device to off or minimum position.
  - g. Turn off the device.
  - h. Disconnect from the setup.
  - i. Unplug the device.

### **Example on Accidental Plagiarism**

This example is taken from a document prepared by the City University of New York.

The following text is taken from Elaine Tyler May's *Myths and Realities of the American Family*:

"Because women's wages often continue to reflect the fiction that men earn the family wage, single mothers rarely earn enough to support themselves and their children adequately. And because work is still organized around the assumption that mothers stay home with children, even though few mothers can afford to do so, child-care facilities in the United States remain woefully inadequate."

Below, there is an excerpt from a student's homework, who made use of May's original text:

"As Elaine Tyler May points out, "women's wages often continue to reflect the fiction that men earn the family wage" (588). Thus many single mothers cannot support themselves and their children adequately. Furthermore, since work is based on the assumption that mothers stay home with children, facilities for day care in this country are still "woefully inadequate." (May 589)".

You may think that there is no plagiarism here since the student is citing the original author. However, this is an instance of accidental plagiarism. Although the student cites May and uses quotation marks occasionally, the rest of the sentences, more specifically the following section: "Thus many single mothers cannot support themselves and their children adequately. Furthermore, since work is based on the assumption that mothers stay home with children, facilities for day care in this country are still "woefully inadequate." (May 589)" almost exactly duplicates May's original language. So, in order to avoid plagiarism, the student either had to use quotation marks for the rest of the sentences as well, or he/she had to paraphrase May's ideas by using not only his/her own words, but his/her own original ideas as well. You should keep in mind that accidental plagiarism often occurs when the student does not really understand the original text but still tries to make use of it. Understanding the original text and understanding why you agree or disagree with the ideas proposed in that text is crucial both for avoiding plagiarism and for your intellectual development.

Reference(s):

*Avoiding and Detecting Plagiarism: A Guide for Graduate Students and Faculty*. The Graduate Center. City University of New York, 2012. Web. <[http://www.gc.cuny.edu/CUNY\\_GC/media/CUNY-Graduate-Center/PDF/Publications/AvoidingPlagiarism.pdf](http://www.gc.cuny.edu/CUNY_GC/media/CUNY-Graduate-Center/PDF/Publications/AvoidingPlagiarism.pdf)>