

## PHYS 102L: General Physics 2 Laboratory

KOÇ UNIVERSITY

College of Sciences

Fall 2017

### COURSE INFORMATION

<b>Laboratory Coordinator</b>	Nazmi Yılmaz (Sci 136)
<b>Laboratory Assistants</b>	TBA
<b>First Laboratory</b>	Tuesday, September 18, 2017
<b>Office Hours</b>	Laboratory Coordinator: Monday B4 (13:00-14:15); and by appointment in SCI 136. Laboratory Assistants: TBA
<b>Laboratory Manual and Required Materials</b>	<i>General Physics 2 Laboratory Manual, 2017</i> <i>Laboratory Notebook</i> <i>Graph Paper Notebook</i> <i>Non-programmable calculator, Ruler, Protractor</i>
<b>Prerequisites</b>	N/A
<b>Grading</b>	Laboratory            6x12% (Lab Report 80%, Lab Quiz 20%) Laboratory Final    28%

<b>Tentative Laboratory Schedule</b>		
<b>General Physics II Laboratory/PHYS 102 Lab</b>		
<b>Fall 2017</b>		
Week1	<b>Sep.18</b>	Laboratory Orientation1: Rules&Regulations
Week2	<b>Sep.25</b>	Laboratory Orientation2: Exp0.
Week3	<b>Oct.02</b>	Exp1: Electrostatics
Week4	<b>Oct.09</b>	Exp1R: Report Writing: Electrostatics
Week5	<b>Oct.16</b>	Exp2: Ohm's and Kirchhoff's Laws
Week6	<b>Oct.23</b>	Exp2R: Report Writing: Ohm's and Kirchhoff's Laws
Week7	<b>Oct.30</b>	Exp3: RC Circuits
Week8	<b>Nov.06</b>	Exp3R: Report Writing: RC Circuits
Week9	<b>Nov.13</b>	Exp4: Lorentz Force
Week10	<b>Nov.20</b>	Exp4R: Report Writing: Lorentz Force
Week11	<b>Nov.27</b>	Exp5: Transformers and Rectifiers
Week12	<b>Dec.04</b>	Exp5R: Report Writing: Transformers and Rectifiers
Week13	<b>Dec.11</b>	Exp6: RLC Circuits
Week14	<b>Dec.18</b>	Exp6R: Report Writing: RLC Circuits
	<b>Dec.27-Jan.07</b>	Laboratory Final Exam

## **Laboratory Course Outline**

### **Experiment1: Electrostatics**

In this experiment you will investigate the characteristics of electrostatic charging, such as charging by induction.

### **Experiment2: Ohm's and Kirchhoff's Laws**

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

### **Experiment3: RC Circuits**

In this experiment you will investigate the charging and discharging of a capacitor in a simple RC circuit. You will also measure the capacitance of a series and a parallel combination of capacitors and compare your results with theoretical calculations.

### **Experiment4: 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.

### **Experiment5: Transformers and Rectifiers**

The purpose of this experiment is to study the electrical characteristics of transformers and rectifiers.

### **Experiment6: RLC Circuits**

In this experiment you will investigate the relationship of the voltage across resistor, capacitor and inductor and you will investigate resonance frequency.

## **Laboratory Attendance**

Students are required to attend all scheduled laboratory experiments. Makeup laboratories are very reluctantly given only with a university approved medical excuse, and if given, will always be harder than the original laboratory experiments. Students should not plan to take makeup laboratory experiments.

## **Before the Laboratory Experiment**

Students should bring the laboratory manual, laboratory notebook, graph papers, and a scientific calculator to the laboratory. Anyone who does not have the manual as well as the laboratory notebook will not be allowed to perform the experiment. Students should read the manual before coming to the laboratory to do the experiment. Students are expected to collect enough knowledge about the experiment by reading the introduction and theory sections to have the necessary theoretical background of the experiment. The students should read the procedure section in order to familiarize themselves with the experiment, before coming to the laboratory.

## **Laboratory Quiz**

There is going to be a 10 minute quiz about the theoretical background and procedure of the experiment in the beginning of each laboratory session. The quiz grade constitutes 1/5 of the laboratory grade.

## **During the Laboratory Experiment**

Students have to come to the laboratory on time. Anyone who fails to come to the laboratory within the first 15 minutes will be assumed absent. The time determined for each experiment is 75 minutes. Students are expected to complete all laboratory work within this determined time. If this time does not suffice for the laboratory work, the students will not be given additional time.

Students are expected to check the instruments and components needed for the experiment and report anything missing or unusual. After the experiment starts, they will be responsible from the experimental set-ups. During the experiments, the students must take all the necessary data and perform all the calculations to analyze the experiment. They should answer the questions, which are asked in the laboratory manual, in the experimental report.

## **After the Laboratory Experiment**

The students should get their data checked and confirmed by the laboratory instructor, before leaving the laboratory. After completing the experiment, students should clean up the experimental setup and properly turn off all the electronics and the computer. Students should leave the instruments and components in good condition. All instruments must be turned off and disconnected. The table should be left in good order. The students should show the laboratory assistant, that there is no missing equipment. The students are not allowed to leave, before the assistant's approval. Taking equipment out of the laboratory is an offense and may result in disciplinary action. Moreover, the students will be financially responsible to replace all the missing equipment.

## Laboratory Reports

Each Student should submit a report of the experiment biweekly.

Introduction, theory and experimental set up sections of laboratory report, should be hand written on a clear A4 paper as a preliminary work and should be handed to the laboratory instructor with the laboratory quiz before starting the experiment.

Data analysis, discussion and conclusion sections of laboratory report will be written on your laboratory notebook a week after the experiment.

Students are not allowed to use pencil in any characters, figures, drawings, etc.

Students are not allowed to remove their laboratory notebooks from the laboratory.

Figures and tables must have figure and table numbers and captions.

Late reports will not be accepted.

### Laboratory Report Format

The laboratory report should include the following sections in scientific format:

#### **Introduction (5 %)**

In this section, state your reason of performing this experiment. Write down your hypothesis, your prediction of the answer to the problem that will be investigated in the experiment.

#### **Theory (5 %)**

Theory section should include the theoretical background and the equations related to the experiment.

#### **Experimental setup and procedure (5 %)**

This section should include the explanation of the set up and the brief procedure of the experiment.

#### **Data analysis (35 %)**

Data analysis section should include the data in tabular form and the plots with suitable titles, units, and scales on both coordinate axes.

#### **Discussion (40 %)**

Discussion section should include detailed answers to the questions.

#### **Conclusion (10 %)**

In this section, write the conclusions drawn from the experiment. State whether your hypothesis was correct or not and summarize what you have learned in the experiment.

## **Physics Laboratory Safety**

By following the rules in the physics lab, you can make the lab safe not only for yourself but also for all those around you.

1. Never work in the lab unless an instructor is present and aware of what you are doing.
2. Prepare for the lab activity or experiment by reading the laboratory manual first. Ask questions about anything that is unclear to you. Note any cautions that are stated.
3. Dress appropriately for a laboratory. Avoid wearing overly bulky or loose-fitting clothing or dangling jewelry. Pin or tie back long hair, and roll up loose sleeves.
4. Keep the tabletops free of any books and materials not needed for the lab you are working on.
5. Never throw anything in the laboratory.
6. Use the apparatus only as outlined in the laboratory manual or by your instructor. If you wish to try an alternative procedure, obtain your instructor's approval first.
7. When working with electric circuits, be sure that the current is turned off before making adjustments in the circuit.
8. If you are connecting a voltmeter or ammeter to circuit, have your instructor approve connections before you turn the current on.
9. Do not connect the terminals of a dry cell or battery to each other with a wire. Such a wire can become dangerously hot.
10. Report any injuries, accidents, or breakage to your laboratory instructor immediately. Also report anything you suspect may be malfunctioning.
11. Work quietly so that you can hear any announcements concerning cautions and safety.
12. Know the locations of fire extinguishers, fire blankets, and the nearest exit.
13. When you have finished your work, check that the electric circuits are disconnected. Return all materials and apparatus to the places designated by your instructor. Follow your instructor's directions for disposal of any waste materials. Tidy your work area.

## **Koç University**

### **Statement on Academic Honesty with Emphasis on Plagiarism**

Koç University expects all its students to perform course-related activities in accordance with the rules set forth in the Student Code of Conduct (<http://vpaa.ku.edu.tr/academic/student-code-of-conduct>). Actions considered as academic dishonesty at Koç University include but are not limited to cheating, plagiarism, collusion, and impersonating. This statement's goal is to draw attention to cheating and plagiarism related actions deemed unacceptable within the context of Student Code of Conduct:

All individual assignments must be completed by the student himself/herself, and all team assignments must be completed by the members of the team, without the aid of other individuals. If a team member does not contribute to the written documents or participate in the activities of the team, his/her name should not appear on the work submitted for evaluation.

Plagiarism is defined as 'borrowing or using someone else's written statements or ideas without giving written acknowledgement to the author'. Students are encouraged to conduct research beyond the course material, but they must not use any documents prepared by current or previous students, or notes prepared by instructors at Koç University or other universities without properly citing the source. Furthermore, students are expected to adhere to the Classroom Code of Conduct (<http://vpaa.ku.edu.tr/academic/classroom-code-of-conduct>) and to refrain from all forms of

unacceptable behavior during lectures. Failure to adhere to expected behavior may result in disciplinary action.

There are two kinds of plagiarism: Intentional and accidental. Intentional plagiarism (Example: Using a classmate's homework as one's own because the student does not want to spend time working on that homework) is considered intellectual theft, and there is no need to emphasize the wrongfulness of this act. Accidental plagiarism, on the other hand, may be considered as a 'more acceptable' form of plagiarism by some students, which is certainly not how it is perceived by the University administration and faculty. The student is responsible from properly citing a source if he/she is making use of another person's work. For an example on accidental plagiarism, please refer to the document titled "An Example on Accidental Plagiarism".

If you are unsure whether the action you will take would be a violation of Koç University's Student Code of Conduct, please consult with your instructor before taking that action.