

## PHYS-225: Electricity and Magnetism Laboratory

Summer 2022

<b>Instructor:</b>	Dr. Demet Usanmaz	
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<b>Office Hours:</b>	Thursday: 9:05 -12:20 (Virtual) (Please email me to schedule an appointment)	
<b>Pre-requisite:</b>	PHYS 114, PHYS 115, MATH 102/MATH 102X/MATH 102H	
<b>Co-requisite:</b>	PHYS 224, and MATH 203/MATH 203H	
<b>Credit Hours:</b>	1 credit	
<b>Date &amp; Time:</b>	Section 1	Wednesday 8:00–10:05 a.m.
	Section 2	Wednesday 10:15–12:20 p.m.
	Section 3	Wednesday 1:20 – 3:25 p.m.
	Section 4	Wednesday 3:35 – 5:40 p.m.
<b>Materials for the course:</b>	Course materials are available online through Blackboard. A bound lab notebook is required to keep an organized record of your observations and data.  You will be using the Graphical Analysis software by Vernier for data acquisition and processing. You should install a copy on your own computer under the Department's license by following the links posted in the "General Resources" content area of Blackboard. (The software is not available via KUCloud or most computers on campus)	
<b>Course Description:</b>	This laboratory investigates the physics of electricity and magnetism. It includes a practical study of electric potential and electric current, and as well as the fundamental circuit element: capacitors, resistors, and inductors.	
<b>Course Learning Outcomes:</b>	During this laboratory course, successful students will: <ol style="list-style-type: none"><li>1. Ask and answer scientific questions through experimental design and implementation.</li><li>2. Develop technical and practical laboratory skills.</li><li>3. Generate, analyze, and interpret data.</li><li>4. Identify sources of error that appear in experimental methods.</li><li>5. Incorporate uncertainty in measured values, calculated values, and graphical representations.</li><li>6. Write effective technical reports that connect theoretical models to laboratory activities, using appropriate style and voice.</li></ol>	

**Classroom Policies:**

**Attendance Policy/Make-up Labs:** Students must attend classes face-to-face unless they are granted an exception. All lab sessions will be in-person, unless otherwise announced.

You may only attend the lab section for which you are registered, unless you have explicit permission to attend a different section. The lab starting and ending times are firm, although it may be possible to complete the lab before the published ending time.

You must complete all labs to complete the course. If you must miss a lab session, contact your instructor immediately. Failure to attend class may be reported to Academic Services and the Registrar. Except in the case of emergency, you must contact your instructor prior to the lab to be missed. If an absence is not excused, then no make-up opportunity will be given, you will receive 0% on the missed lab. Excused absences require 24 hours prior notice by email except in emergency situations. Unexcused absences do not extend pre-lab due dates.

At most one make-up lab will be allowed per term except in extenuating circumstances.

If you miss more than three labs, excused or not, you will be withdrawn from the course.

**Grades:**

All grades will be recorded on Blackboard. The final lab grade will be calculated according to the following distribution:

Attendance & Participation & Lab notebook	30%
Pre-labs	20%
Group Deliverables	50%

**Pre-lab Assignments:** The purpose of the pre-lab assignment is to introduce the material that will be investigated during the lab, so make sure to read through the lab handout and any background documents for any given week. Prelab assignments are posted on Blackboard for each of the experiments, and should be submitted by the due date/time indicated in the schedule below. No late pre-lab assignments will be accepted, and a grade of zero will be recorded for not submitting the assignment on time.

**Lab Notebooks:** Each student is required to bring a bound notebook to lab each week. A well-organized notebook is easily detectable at a glance, so pay close attention to formatting procedures stated during the first experiment of the semester. The goal of the lab notebook is to practice recording data and results in a well-organized and legible format.

**Lab Reports:** Since one of the course objectives is to communicate experimental results in a coherent, well-organized, written manner, it is important to practice writing lab reports. The schedule indicates the type of lab report (deliverable) due for any given lab activity. Deliverables should be submitted on Blackboard by one member of the group under the corresponding assignment link. Please plan ahead and follow the due dates/times specified in the schedule below.

Furthermore, letter grades will be assigned at the end of the semester according to the following scale

A	≥ 93 %	A-	92 – 90 %		
B+	89 – 87 %	B	86 – 83 %	B-	82 – 80 %
C+	79 – 77 %	C	76 – 73 %	C-	72 – 70 %
D+	69 – 67 %	D	66 – 60 %		
F	≤ 59 %				

All grading will be done on an absolute scale: Curve will not be applied!

\* Instructor reserves the right to add, delete or alter any points, assignments, or assessments throughout this course. This will be done for all the students in the class in an equitable manner.

#### Academic Integrity:

Kettering University values academic honesty and integrity. Cheating, collusion, misconduct, fabrication, and plagiarism are serious offenses. Each student has a responsibility to understand, accept, and comply with the University's standards of academic conduct as set forth in our statement, "Ethics in the University" and "Academic Integrity" as well as policies established by individual professors. For more information, refer to the Undergraduate Catalog or the University's policy on Ethical and Behavioral Standards. This information is also noted in the Student Handbook.

Although students working within the same group will have the same data, recording of the data into the lab notebook is to be completed individually. Group members may share graphs created during lab time in order to be secured in each student's lab notebook. Error values are to be calculated individually in lab notebooks, as well as sample calculations using the data. Results should be recorded in each student's notebook.

All written assignments for this course will be submitted through Blackboard. Blackboard uses SafeAssign, a program which cross-references every submitted assignment with previously submitted assignments. Copied lab deliverables, including just sections of deliverables, will be automatically flagged for the instructor.

Any and all forms of cheating by all parties involved will be severely punished. Any form of cheating on a pre-lab assignment or a deliverable will result in a zero for that assignment. A second offense will result in receiving an F grade for the course. All incidences of academic misconduct will be reported to the Dean of Students and the Academic Success Center. Students have the right of appeal as outlined in the Final Grade Appeal Process described in the Undergraduate Catalog.

#### Inclusive Learning Environment:

Kettering University is committed to an inclusive learning environment free from discrimination or harassment based on gender, sexual orientation, gender identity, or expression. Such discrimination and harassment include sexual harassment, sexual

	<p>assault, stalking, domestic/dating violence, or any other form of sex-based discrimination. The University encourages anyone who experiences such harassment or discrimination to report the matter to the Kettering University Title IX Coordinator, Betsy Homsher, at <a href="mailto:bhomsher@kettering.edu">bhomsher@kettering.edu</a>, 810- 762-9540. For more information about your options, including reporting and confidential resources, please visit <a href="https://my.kettering.edu/page/what-title-ix">https://my.kettering.edu/page/what-title-ix</a>.</p>
<b>Class Environment:</b>	<p>Each member of this class is valued, and is expected to 1) treat everyone else with respect and 2) contribute to a welcoming and inclusive environment, 3) equally contribute to the work during lab sessions and in group reports.</p>
<b>Kettering University Policies:</b>	<p>See the University Policy Syllabus for statements on students with documented disabilities, ethics in the university and academic integrity, medical excuse policy, academic assistance, and sex and gender-based discrimination.</p> <p>Students must provide documentation to the instructor at least a couple of days before the date, if services/accommodations are needed.</p>
<b>Syllabus content:</b>	<p>The syllabus content is subject to change at any time. Any item on the syllabus may change at the discretion of the instructor. All changes will be communicated to the class. Additionally, I reserve the right to adjust the grade scale as I deem necessary.</p>

This course schedule is subject to change. Changes will be announced in class or posted to Blackboard.

Week	Date	Topics	Deliverable	Pre-lab Due (by 11:59 pm)	Deliverable Due (by 11:59 pm)
1	Jul 13	Electric Charge and Field	Post-Lab	Jul 19	Jul 19
2	Jul 20	Lightbulbs/Simple Circuits	Post-Lab	Jul 19	Jul 26
3	Jul 27	Resistors	Post-Lab	Jul 26	Aug 2
4	Aug 3	Resistors Writing Workshop	Full Report	---	Aug 9
5	Aug 10	Current-Voltage Characteristics	Post-Lab	Aug 9	Aug 16
6	Aug 17	Current-Voltage Characteristics Writing Workshop	Full Report	---	Aug 23
7	Aug 24	Electric Field and Potential	Post-Lab	Aug 23	Aug 30
8	Aug 31	Electric Field and Potential - Writing Workshop	Full Report	---	Aug 6
9	Sep 7	Magnetic Field	Post-Lab	Aug 6	Sep 13
10	Sep 14	Magnetic Field Writing Workshop	Full Report	---	Sep 20