PHYS263: University Physics III Laboratory
Summer 2020-Virtual Lab (Section 2C2)
Tuesday/Thursday/Saturday: 12:30PM-03:30PM

Instructor: Nishchal Thapa Magar
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Office: Via Blackboard Collaborate Ultra
Office Hours: Wednesday 03:00pm-04:00pm or by appointment

Course Description

Prerequisites: C or higher in PHYS261. **Co-requisite:** PHYS262. Experiments in optics and modern physics, including techniques for recording, graphically and statistically analyzing, and reporting data. PHYS263 University Physics III Lab is approved for the Natural Sciences category in the Mason Core: https://masoncore.gmu.edu/natural-science-lab-and-non-lab/

Experiment Schedule

Date	Exp. No.	Experiment
July 7th	1	Introductory exercises: Error and uncertainty in lab Measurements
July 9th	2	Signal velocity on a Coaxial Cable
July 11th	3	Transients in LRC circuits
July 14th	4	Frequency components of Non-Sinusoidal Waves
July 16th	5	Stefan-Boltzmann Radiation Law
July 18th	6	Heat Engine and Ideal Gas Law
July 21st	7	Geometric optics
July 23rd	8	Photoelectric Effect
July 25th	9	Wave optics: Interference, Polarization
July 28th	10	Michelson Interferometer
July 30th	11	Intensity vs. Angle of Reflections
Aug. 1st	12	Spectrum of Atomic Hydrogen
Aug. 4th	-	**Make-up Lab**

General Instructions

1) **Laboratory partners**
   Since the lab is online, everyone should work by themselves. All students must submit his/her individual pre-lab write-up and lab report.

2) **Pre-lab assignment**
   You are expected to read the experiment before coming to the lab. You need to submit the pre-lab report at the beginning of the lab.

3) Individual pre-lab report (25 pts)

The pre-lab report should contain the following things:

Name: write your name (1 pt)
Subject: PHYS263-2xx (insert your section number) (1 pt)
Date: write the date of your experiment (1 pt)

Title of the experiment (1 pt)

i) **Objective(s):** write the purpose(s) of the experiment. (2 pts)
ii) **Theory:** briefly describe the theory behind the experiment. **Be sure to write down the working formula defining each variable and their units.** (10 pts)
iii) **Apparatus:** list all the apparatus that you will use in the experiment. Include a **"hand drawn"** diagram of the experimental set up with proper labels. (4 pts)
iv) **Sample graph:** make a **"hand drawn"** diagram of the sample graph with labels and units on each axis (**NOTE:** this refers to what you expect the results graph(s) to look like). (5 pts)

4) Individual lab report (60 pts)

The results and discussion will be done in the class and the lab report is due at the end of the class. After the completion of the experiment, the final report should contain the following things:

i) **Procedure:** briefly, explain what you did in your own words. Do not copy the lab manual. This section should contain only a few sentences summarizing the procedure. (10 pts)
ii) **Result:** observations and the results of the experiment you conducted (e.g. tables, graphs, and calculations). All tables and graphs must contain proper heading (i.e. "Table 1. Title"; "Figure 1. Title"), labels and units. (30 pts)
iii) **Conclusion:** write what your objective for the lab was then critically describe if you achieved your objective. Your conclusion should reflect the main message (or physics) involved in the experiment. Discuss the possible source(s) of error, if any. (20 pts)

NOTE: consult the Sample Lab Report as a guide for your pre-lab and lab reports.

You will need to work efficiently, and come to lab prepared to complete the experiment and write-up on time. We will be using MATLAB for data analysis, but only within the lab time. I will provide MATLAB code on Blackboard that can be run for analysis before each lab. You will not need to use it outside of the lab. If, however, you would like out-of-lab access to MATLAB to get comfortable with it you can find instructions here: http://math.gmu.edu/~eobrien/math111/matlab.html

5) Lab notebook: Since Lab notebook could not be provided physically, you can use US Letter paper sheets /A4 paper size. Both pre-lab and lab report must be handwritten. You will submit both to the instructor for grading via Blackboard.

6) Attendance

Attendance in the lab is a must. An excused lab can usually be made at the end of the semester, but only with a **VALID medical excuse (documentation required)**. Please notify me as soon as you return to school. **DON'T BE LATE** for the lab.

7) Grading

All labs count equally. Each lab will be graded for 85 points. I will use the following grading scheme for the lab report:

Pre-lab - 25 points
Lab participation and results - 40 points
Conclusion - 20 points.

Final grade will be 100% from lab reports. Letter grades will be assigned later in the semester.

8) If you are a student with a disability and you need academic accommodations:

Please see me and contact the Office of Disability Services at 703-993-2474. All academic accommodations must be arranged through that office. Students must inform the instructor at the beginning on the semester, and the specific accommodation will be arranged through ODS.

9) **Academic Integrity:**
GMU is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. Honor Code: To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set forth this honor code: Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.

10) **Be creative and honest:**
If your results are not what you expected them to be, talk to me. If you honestly performed the experiment to the best of your ability, and there is an error, you should still report your findings. **DO NOT** copy or share the lab reports.

Notice of mandatory reporting of sexual assault, interpersonal violence, and stalking:
As a faculty member, I am designated as a "Responsible Employee", and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason's Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason's confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or Counseling and Psychological Services (CAPS) at 703-993-2380. You may also seek assistance from Mason's Title IX Coordinator by calling 703-993-8730 or emailing titleix@gmu.edu.