



**INSTRUCTOR:** Richard West  
**OFFICE:** 476  
**E-MAIL:** rdwest@siu.edu  
**OFFICE HOURS:** M10-1pm, TR12-1:30pm

**REQUIREMENTS:**

1. Physics 253B/255B New Laboratory Manual, 2006-2007, Hayden-McNeil Publishing, Inc.
2. Pdf files located on lab computer
3. Scientific calculator

**CATALOG DESCRIPTION:** **One two-hour laboratory per week.** Prerequisite: completion of or concurrent enrollment in 203B/205B; if the *corresponding lecture course is dropped, the laboratory course must also be dropped*. Lab fee: \$25.

**CREDIT:** 1 Hour

**COURSE OBJECTIVE:** Upon successful completion of this course, the student will be able to:

- Establish a hands-on understanding of electromagnetism
- Understand the wave-like behavior of nature with application to light.
- Solve practical equations in a laboratory setting.

**ATTENDANCE:** Attendance for this course is **mandatory**. Since there are no make-up labs, you must attend every lab session. Allowed absences are given for the following documented reasons only: (i) Religious observance; (ii) Military service; (iii) Bereavement (i.e., death in your immediate family); (iv) Official university business (properly documented using appropriate forms from an athletic or academic advisor); and (v) a properly documented medical reason. Note: A slip stating that the student visited the Student Health Center does not fulfill this requirement. Documentation that you were hospitalized or an official doctor's note is required.

**LAB REPORTS:** There will be two types of labs: (1) traditional labs (T), in which data is taken by hand and (2) computer labs (C), done using the computer and attached equipment to gather data. Attached to this syllabus is a schedule of the labs. The type of report will depend on which type of lab you are doing.

**A. Traditional Lab Reports:** Data will be collected manually and shared by all the members of the group. Report format is as follows (follow the format of the sample lab provided in your lab manual on page iv):

- Title of the lab, your name, course number and section number, date.
- Objective: What is the point of doing this lab? What are you trying to achieve/learn?

- Apparatus. What instruments and materials did you use in the lab?
- Introduction/theory. In your own words, briefly, describe the theory behind the experiment.
- Results. This section should include the data collected during the lab, graphs you made from data collected, calculation you had to do.
- Error Analysis. What errors occurred? Why? Percent error calculated between theoretical and experimental values.
- Discussion and Conclusions. Brief discussion of what you learned, what could be improved.
- Answers to Questions.

**Due date**

Reports are due **3 days after the meeting.**

- Late reports **will not be accepted.**
- Reports must be Uploaded onto SIU Online (Desire2Learn), <https://online.siu.edu/>

**B. Computer Lab Reports**

- Choose the electronic workbook that corresponds to the lab scheduled for that specific week.
- The lab is divided into three sections: (1) Record data, (2) Analyze, and (3) Synthesize.
- Follow the computer instructions in each section and answer all required questions on the computer. Remember to include units when you report your results.
- You may save the lab report to your flash drive. Do not save it on the lab computer.
- **Upload the file onto SIU Online (Desire2Learn), <https://online.siu.edu/> (One report/group)**

**PRE-LAB:**

The pre-lab is to determine that you have read the lab manual ahead of time and have an idea what is going to be covered in that week's labs. Lowest grade will be dropped.

**No make-up pre-lab will be allowed**

**QUIZZES:**

A written quiz will cover material from the previous three labs. Quizzes will be taken before the respective lab and will be between 15-20 minutes in length. Students will be graded on their ability to answer questions. Lowest grade will be dropped.

**A make-up quiz will be given for valid absence only**

**FINAL EXAM:**

There will be a comprehensive final exam given during the last week of classes.

## GRADING:

<b>WEIGHTS:</b>	Lab Report	60%	<b>SCHEME:</b>	90.0 - 100 % = A
	Pre-Lab	05%		80.0 - 89.9 % = B
	Quizzes	15%		70.0 - 79.9 % = C
	Final Exam	20%		60.0 - 69.9 % = D
				0.0 - 59.9 % = F

**Note:** We will drop the lowest mark from each category of assignments (excluding the Final Exam)

### **ACADEMIC DISHONESTY AND STUDENT CONDUCT CODE**

We will follow this code as posted in  
<http://policies.siu.edu/policies/conduct.html>

### **NOTE:**

If you should drop the lecture course at some point during the semester, you must also drop the lab course.

### **CELL PHONE USE POLICY**

Cell phone use (of *any* kind – voice, texting, calculator, photography...) or the use of other personal electronic devices (unless approved by the instructor) is not allowed during the lab. Phones must be rendered *inaudible* (either turn them off completely or at least set them to silent mode) during the lab time. **Note:** During *exams and quizzes*, any cell phone or computer use will automatically constitute *cheating* (and will be dealt with as such).

### **EMERGENCY PROCEDURES**

Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on BERT's website at [www.bert.siu.edu](http://www.bert.siu.edu), Department of Safety's website [www.dps.siu.edu](http://www.dps.siu.edu) (disaster drop down) and in Emergency Response Guideline pamphlet. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.

[http://www.dps.siu.edu/Documents/Emergency\\_Response\\_Guide\\_2007.pdf](http://www.dps.siu.edu/Documents/Emergency_Response_Guide_2007.pdf)

## TENTATIVE LAB SCHEDULE

Week #	Week of	Activities	Lab Topic	Type*
1	Aug.19 <sup>th</sup>	No Lab	<b>Orientation:</b> Introduction to course layout and policies	
2	Aug.26 <sup>th</sup>		<b>Electroscope; Basic Magnetism:</b> Explore fundamental electrostatic concepts of like/unlike charge repulsion/attraction; Explore fundamental concepts of magnetism regarding like/unlike pole repulsion/attraction	T
3	Sep.02 <sup>rd</sup>		<b>Electric Fields:</b> Determine the configuration of the electric field between various systems of electrodes by mapping equipotential lines	T
4	Sep.09 <sup>th</sup>		<b>Deflection of Electrons:</b> Observe the effect of an electric field on a charged particle	T
5	Sep.16 <sup>th</sup>	Quiz 1	<b>Ohm's Law:</b> Study the relationship between voltage, current, and resistance	T
6	Sep.23 <sup>th</sup>		<b>DC Series:</b> Use a voltmeter to measure current and voltage in a series circuit to determine what happens to the current as more resistors are added in series to the circuit	T
7	Sep.30 <sup>th</sup>		<b>DC Parallel:</b> Use a voltmeter to measure current and voltage in a parallel circuit to determine what happens to the current as more resistors are added in parallel to the circuit	T
8	Oct.07 <sup>th</sup>	Quiz 2	<b>Wheatstone Bridge:</b> How to measure an unknown resistance	T
9	Oct.14 <sup>th</sup>		<b>RC Circuit:</b> Use a voltage sensor to measure the voltage across a capacitor as it charges and discharges in a resistor-capacitor (RC) circuit and use measurement data to calculate the capacitance of the capacitor	T
10	Oct.21 <sup>nd</sup>		<b>Magnetic Field Around a Wire:</b> Use a magnetic field sensor and voltage-current sensor to find the magnetic field strength and current in a loop of wire	C
11	Oct.28 <sup>th</sup>	Quiz 3	<b>Magnetic Field of a Solenoid:</b> Discover what the magnetic field is like inside a coil of wire known as a solenoid, calculate the magnetic field strength inside of the solenoid, and then using a magnetic field sensor, measure the magnetic field strength inside a solenoid and compare with the calculated value	C
12	Nov.04 <sup>th</sup>		<b>Faraday's Law:</b> Using a voltage-current sensor, measure the electromotive force (emf) induced in a coil of wire when a magnet is dropped through the center of the coil	C
13	Nov.11 <sup>th</sup>		<b>Rays, Mirrors:</b> Study the reflection and refraction of light for mirrors and lenses using the ray approximation	T
14	Nov.18 <sup>th</sup>	Quiz 4	<b>Diffraction of Light:</b> Investigate the wave nature of light by studying single-slit and double-slit diffraction patterns	C
15	Nov.25 <sup>th</sup>	No Lab	<b>Thanksgiving: Nov.27<sup>th</sup> – Dec.1<sup>st</sup></b>	
16	Dec.03 <sup>rd</sup>		<b>FINAL EXAM</b>	

\*T = Traditional lab (use SIU Lab manual or the given PDF)

C = Computer lab (Cutnell & Johnson lab manual)