

Electromagnetic Universe Laboratory Manual

PHY-216
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DENNIS C. HENRY

JAMES MILLER

CHARLES F. NIEDERRITER

PAUL SAULNIER

JESSIE A. PETRICKA

PHYSICS DEPARTMENT

GUSTAVUS ADOLPHUS COLLEGE



Gustavus Adolphus College
Fall 2023

Instructor: Paul Saulnier
Office: Olin Hall 208, 933-6123
E-Mail: PSAUL@GUSTAVUS.EDU

Textbook: *The Electromagnetic Universe Laboratory Manual 2023*, by Henry, Miller, Niederriter, Petricka, and Saulnier.

Required Materials: Two 80-sheet quadrille ruled lab notebooks.

1. **General:** Twelve laboratory sessions will be held during the semester. There will be no lab during the week of the Nobel Conference or Thanksgiving.
2. **Attendance:** Regular attendance at all labs is required. Students will be held responsible for informing themselves of all announcements and assignments made in the laboratory classroom as well as in the daily classroom meetings. Any last minute communications will be by electronic mail.
3. **Makeup:** Any student who misses a lab during the semester with a valid (certifiable) excuse, must arrange with the instructor to make up the lab outside of regular class time.
4. **Laboratory Work:** All lab work for each experiment will be detailed in the lab handout. The introduction in the manual covers important information on lab course objectives, **notebook and formal report formats**, grading, content, and late report penalties. **Refer to it often.**
5. **Pre-lab Preparation** - The **entire** lab handout should be read in preparation for the lab period. You must have read the experimental procedure and complete the title, objective, and brief theory section of your lab notebook before attending your lab section. Any other pre-lab assignments must be complete in their entirety before attending the lab.
6. **Lab Notebooks:** A lab notebook is required for each of the experiments. The notebook is due at the beginning of the following lab session. These reports will be written entirely in the student's lab notebook, and thus two such notebooks will be needed for the course. Notebook reports will be graded on a 10 point basis, and *there will be a penalty for late reports*. Each student should write his/her own lab reports, even though the experiments were performed with a partner or partners. *Lab reports submitted which are found to be identical (or nearly identical) will have the total grade points divided among the identical notebooks.*
7. **Scientific Writing:** Scientific writing assignments (formal reports) will be given throughout the semester, as shown in the schedule. The format and due date for the assignments will be announced in lab, and each will be graded on a 20 point basis. Writing assignments should be word processed, double spaced on white 8.5" x 11" paper. There will be a penalty for late writing assignments.
8. **Incompletes:** A grade of incomplete will be given only for work not completed due to circumstances beyond the control of the student.

9. Evaluation: Lab notebooks and any pre-labs (60%), writing assignments (20%), and lab final (20%).

Final course grades will be assigned using the following scale as a guide:

94-100 A	82-86 B	70-74 C	58-62 D
90-94 A-	78-82 B-	66-70 C-	0-58 F
86-90 B+	74-78 C+	62-66 D+	

Assignment of the final letter grades will also take into account other factors including the instructor's subjective evaluation of the student's attendance, initiative, evidence of improvement, and the quality of independent work.

Accessibility Resources

Gustavus Adolphus College is committed to ensuring equitable and inclusive learning environments for all students. If you have a disability and anticipate or experience barriers to equal access, please speak with the accessibility resources staff about your needs. A disability may include mental health, attentional, learning, chronic health, sensory, physical, and/or short-term conditions. When appropriate, staff will guide students and professors in making accommodations to ensure equal access. Accommodations cannot be made retroactively; therefore, to maximize your academic success at Gustavus, please contact them as early as possible. Accessibility resources staff are located in the Academic Support Center (<https://gustavus.edu/care/accessibility/>) (x7227). Accessibility Resources Coordinator can provide further information.

Laboratory Schedule (Thursday, 2:30-4:20 p.m.)

<u>Date:</u>	<u>Experiment:</u>
September 7	Computer Plotting and Fitting Basics
September 14	Electrostatics Writing Assignment #1 (WA1)
September 21	Electric Field Lines and Equipotential Lines (WA2)
September 28	Capacitors (WA3)
October 3-4	Nobel Conference – We DO have lab this week.
October 5	Digital Multimeters and DC Circuits
October 12	The Oscilloscope
October 19	Wheatstone Bridge and Max. Power Transfer (WA4)
October 26	Determination of the Earth's Magnetic Field
November 2	The Current Balance (WA5)
November 9	Faraday's Law

November 16	RLC Transient Circuits	
November 22-26	Thanksgiving Break – No Lab	
November 30	AC Circuits	(WA6)
December 7	Lab Final	