

**PHY271: Electronics and Instrumentation Lab**  
**Spring 2023**  
**Gustavus Adolphus College**

<b><u>Instructors:</u></b>	Tom Huber	Steve Mellema
<b><u>Office:</u></b>	Olin Hall 209, 933-7036	Olin Hall 210, 933-7306
<b><u>Email:</u></b>	<a href="mailto:huber@gustavus.edu">huber@gustavus.edu</a>	<a href="mailto:mellema@gustavus.edu">mellema@gustavus.edu</a>

- 1. Meeting Time:** The laboratory meets once each week for two hours in Olin 113.  
**Lab Notebooks:** Each student's primary responsibility will be to maintain lab notebooks where the purpose is to detail completely the theory, procedures, data, analysis, and conclusions for every experiment. It is a complete, chronological record of everything you do for each experiment. The lab notebook is due at the beginning of lab one week after the experiment is performed. Notebooks will be graded on a 10 point basis and will be evaluated on: successful completion of the experimental measurements, data analysis, appropriateness and accuracy of procedures, and overall documentation. Pervasive errors in grammar, spelling and proper English usage may adversely affect the lab grade. A penalty of 1 point per day will be deducted for late reports. No lab reports will be accepted after 5:00 PM on Reading Day. Two lab notebooks books will need to be purchased, because they will be handed in on a rotating basis.
- 2. Formal Laboratory Reports:** Formal written laboratory reports will be required for two experiments (one being the final project). The format, evaluation method, and due dates for the reports and the method of evaluation will be described separately.
- 3. Attendance:** Students are expected to attend all laboratories during their scheduled section. Students are responsible for informing themselves of material and assignments covered during absences. Students must advise the instructor in writing during the first week of class of any scheduled athletic, music, or other college activities that will require their absence during the semester. Such written notice does not imply a waiver of course requirements or an agreement to reschedule labs. Missed labs must be made up. Permission to perform a lab at other than the scheduled time must be scheduled with the instructor.
- 4. Preparation for Laboratory:** Students are expected to read and understand the purpose and general procedures in the lab manual before coming to the lab. Advance preparation is an absolute requirement for the efficient use of the limited lab time, and failure to prepare can be (painfully) obvious. A pre-lab quiz is due 15 minutes before the beginning of the lab period for each experiment and will cover the information provided in the lab manual for that week's experiment. Please bring your calculator and course text to lab for use when necessary.
- 5. Lab Final Project:** During the last two weeks of the course, there will be a final project. This project will ask each student to design a circuit using combinations of components. Successful completion of the project will require using the techniques learned throughout the course (sometimes to components not covered in class). Students will be required to demonstrate their project to the instructor, and write a formal report describing their project.
- 6. Academic Honesty:** In this course, students are expected to discuss their lab work. This collaborative work, however, shall include equal effort by all students involved. Parasitizing or merely copying other students for any work or assignment is a violation of the Honor Code. Students pledge that they shall submit their own work and violations of academic honesty will result in a zero for the entire assignment and reporting to the dean of students as a minimum

penalty. (For a more complete discussion, see the Academic Honesty section in the PHY-270 Syllabus)

7. **Incompletes:** A grade of incomplete will only be given for work not completed due to circumstances beyond the control of the student. (This is the college policy).

8. **Evaluation:**

Lab Notebooks	60%
Formal Reports	10%
Lab Final Project	15%
Pre-labs	15%

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

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

10. **Schedule of Labs** – \*\* indicates formal reports

1. Introduction to Test Equipment
2. AC Circuits
3. Passive RC Filters
4. Regulated DC Power Supplies
5. Design and Construction of an Amplifier
6. Operational Amplifier Practicum \*\*
7. Comparators and Schmitt Triggers
8. Transistors, Phototransistors and Relays
9. Properties of Digital Logic Gates
10. Introduction to Sequential Logic
11. JK Flip-Flops
12. Final Project \*\*