

Object: To invent your own experiment regarding coils and transformers.

Introduction: You now know, from two semesters of experience, how labs in PHSX 221L and PHSX 222L are generally constructed. This is your chance to invent one of your own.

We have available a number of different coils and some laminated cores that can be used to make transformers. You may also consult the instruction manual that came with the coils to give you ideas. It is likely you'll want to use function generators (after all, you can't transform DC voltages) and oscilloscopes as well. Be creative and have fun. You'll want to get an early start on this; don't leave it until the week before the lab.

The Task: As a group, write a lab regarding coils and transformers by doing the following *before* the appointed lab period.

1. Write an object or goal of your lab.
2. Write a theory section including any equations and diagrams the students may need.
3. Write a procedures section. List any appropriate safety measures.
4. Write a results and/or analysis section.
5. Write a questions section designed to make the students think about the outcomes.

You are welcome to pre-try your lab—simply make arrangements to come in on your own time; this is strongly recommended. Bring four or five copies of your experiment, with all your group members clearly labeled as the authors, to the lab period. Aim to have it doable in about $1\frac{1}{2}$ hours.

The Fulfillment: When you arrive at lab class at 12:30 on Wednesday, exchange the prewritten labs with another group and then follow the instructions in the lab you received. Actually do their lab. This *one time* you may do one group write-up rather than a separate write-up for each individual. You may ask clarification questions of the authors while you do it.

Grading: In a group discussion, rate the lab you did (not the one you wrote) on the following characteristics.

1. Well-conceived object or goal, appropriate to the level of the students and designed to teach something important. The significance of the desired learning outcomes.
2. Clarity of the explanations in the theory section.
3. Clarity of the procedures and explanations of the equipment used.
4. Well-written results and/or analysis section.

5. A questions section designed to provoke deep thought in the students.
6. The doability of the lab (especially in the time allotted). But it shouldn't be *too* easy.
7. Overall neatness, impression, and quality (including grammar and spelling).

On another paper (to be attached to the lab you did), list all of your group members as doers and critiquers of the lab (it should be abundantly clear who authored the lab and who critiqued it). On this sheet list the above seven categories and give a rating of 0–5 (0 = worst, 5 = perfect, in fact, 5's are so good that they should be rare) in each of them. Then add up the seven subscores for a total out of 35 possible. A score of 30 would be quite high, reserved for very good labs.