

WINTHROP UNIVERSITY

Department of Chemistry, Physics, & Geology

Semester: Spring 2020

Course: PHYS 202L (001) - General Physics II Laboratory, Sims 205

Meeting Day and Time: Wednesdays 2-4:50 PM.

Credit hours: 0

Co-requisite: [PHYS 202](#)

Professor: Dr. Ponn Maheswaranathan (Mahes), Sims 213-B.

Office Hours: T & Th 11-12:30 and W 11-12:30, or by appointment.

Phone: 323 4940, **E-mail:** mahesp@winthrop.edu

Textbook: College Physics, by OpenStax, **Free Online Textbook:** [College Physics by OpenStax](#), [Conceptual Questions and Problems & Exercises](#).

University-Level Competencies:

General Physics II laboratory introduces students to the role of scientific reasoning in solving introductory physics problems using algebra & trigonometry (e.g. calculating entropy changes in thermodynamics, calculating magnetic field due to electric currents, and analyzing circuits). They will apply the scientific methodologies of inquiry during the laboratory, PHYS 202L, and write well-reasoned conclusions. They will also be introduced to the history of scientific discovery (e.g., topics and devices are introduced with historical perspectives) and learn that the theories in physics evolve into laws after continuous re-evaluations and arguments. In addition they will see how scientific advances made in a laboratory transform into useful technological devices (e.g., the development of the transistor from vacuum tube to silicon chip).

After the completion of the lab, you need to do post-lab quiz, individually, on BB through the **PHYS 202** page, before midnight, the following Thursday. This will carry 10% of the lab score. Completed Lab hand-out is due the following lab period, will carry another 10%, and the Write-up (data tables, graphs, and conclusion) will carry 80% of the lab score.

Lab Schedule:

<u>Lab #</u>	<u>Wed-Thurs</u>	<u>Experiment</u>
1	Jan. 22-23	Heat: Specific Heat and Latent Heat
2	Jan. 29-30	Charge and Field Instructions Data Sheet w/Pre lab
3	Feb. 05-06	Resistance w/Pic Resistance Handout
4	Feb. 12-13	Capacitor
5	Feb. 19-20	Ohm's Law with Pasco
6	Feb. 26-27	Meters
7	Mar. 04-05	Induction and Permeability Constant
8	Mar. 11-12	Oscilloscope
9	Mar. 25-26	Measuring e/k
10	Apr. 01-02	Reflection and Refraction
11	Apr. 08-09 Block Diagram for meas. mag.	Spherical Mirrors and Lenses
12	Apr. 15-16	Interference and Diffraction
13	Apr. 22-23	Spectra
Pl do Lab Course Evaluations and submit the confirmation page in BB.		Course Codes: Wed 2 (001): 20453 Wed 5 (002): 20643 Thur 8 (003): 20817

Lab Reports: At the completion of each lab every student is required to turn in a lab write-up. Students may work with their partner(s) to complete most of the write-up. This means sharing ideas not paragraphs. However, the conclusion section must be completed independently! Students are encouraged to be creative with their conclusions and explain whether or not their results are accurate. If the results are not close to the accepted values, student are expected to give reasons for any discrepancies. The conclusion section is the part of the lab which is most important to check for student comprehension of the topic.

Even though you do the lab and collect data as a group, you should write your own conclusion.

How to write a conclusion?

* Conclusion is the most important part of your report. It is a brief summary-paragraph, about half a page, primarily reflecting about the laboratory experience. You must write your own conclusion, after completing the data collection and analysis. It must be written as the last piece and attached as the last piece, after data tables and graphs.

* Conclusion should state things that are unique for your investigation which can be accomplished by including values of the experimentally determined physical quantities. Just remember that you cannot write your conclusion without completing your experiments or investigations. General statements like "I have determined the densities of given solids" and "Human Error" are not acceptable.

Conclusion Points are listed for 10 point total lab report score:

* Start your conclusion by re-stating the purpose with appropriate changes (0.2 pt). Then you need to briefly state (don't repeat procedure) how you conducted the experiment and collected the data (0.2 pt). Continue this with summarizing your results (make it unique by listing your experimental values) (0.2 pt), referring to the data tables and graphs when appropriate, and answer the purpose (0.2 pt). Then you need to discuss about some of the difficulties you had, errors and their possible causes, and suggestions for improvement (0.2 pt). Describe your reasoning using physics terminology and principles and reflect extensively. You should explain as completely as possible what goes through your mind that leads you to your conclusion. While we encourage you to discuss the investigations with your partners, your conclusion must be your own thought.