

DETAILS:

Each week you will be performing a different experiment for a total of 14 experiments. Each week you should read the lab instructions and other materials, if any, before coming to class, particularly if the material has not already been covered in lecture. There might be a quiz at the beginning of class to assess if you have read the lab manual before coming to class. After a brief lecture, you will complete the experiment with your lab partners. Save some time at the end of the session to record all of the necessary information into your lab notebook. All observations and data collection is to be finished before you leave for the day. Also, before you leave for the day, you must demonstrate that your lab station is clean. Grade points will be deducted for any equipment left out or returned in an unclean condition.

Lab Reports should be comprised of the following parts:

1. Introduction/Purpose
2. Procedure
3. Data, Observations, & Calculations
4. Discussion and Answers to lab questions
5. Conclusion

An example laboratory report format is shown on the following page.

The lab report should be typewritten and turned in to the lab instructor at the next laboratory period. The materials for your lab report must be stapled together. Also it is your responsibility to make sure that your lab instructor receives your lab report in the appropriate condition. Illegible reports may not be graded.

Each of the labs will be graded on a 20-point scheme. Neatness does count. **Another person should be able to follow** both what was done and the results that were obtained simply by looking at your completed report. If your instructor judges the work to be messy, illegible, or if the work does not include all of the required components, he or she may give a grade of zero without the opportunity to resubmit the work. **Points will be deducted for insufficient detail.** This is especially important in the procedure section of your lab. You must provide a clear and detailed explanation of what **YOU** did to complete the lab assignment. Points will be deducted for copying verbatim the procedure as described in the lab manual.

Although you may be assigned to work in teams of two or more during the lab session, each person must submit their own lab report for each lab. While it is important for lab teams to discuss the results and formulate answers to the lab questions, each person must write the results and answers in their own words. **Copying will not be tolerated.** Reports which are similar or the same in detail will have points deducted from all team members. This policy is to dissuade students from writing one lab report and submitting it with different names, or for one student to copy sections from another member's report.

TIPS FOR SUCCESS

Students should know what they will be doing and why *before* each lab. Reading the experimental procedure and completing any pre-lab questions before each laboratory session is strongly advised.

Example Laboratory Report Format

Name: _____

Title of Experiment: _____

Date: _____

Lab Section: e.g. Thursday 11:00 – 1:30 _____

**I. Introduction/
Purpose:** This should be one or two sentences that explain(s) what you plan to do during the laboratory experiment.

Example. *This experiment will determine the density of several samples by measuring their volume and determining their mass on a balance.*

II. Setup/ Apparatus The second section of the lab report should contain a detailed listing of all of the equipment and measuring tools used. When appropriate, make a labeled diagram (sketch) of the apparatus. This section should present all of the information needed to reconstruct your experimental setup.

II. Procedure: A clear and detailed description of the experimental procedure used in the lab. This is to be in your own words, not copied from the laboratory manual. Do not include laboratory observations in the procedure section. This section is typically written in the past tense third person.

III. Data, Observations & Calculations: This section will contain all the observations, raw data, and calculated values with clearly performed examples from the experiment. This may simply be the data sheet found at the end of an experiment (with all the observations and calculations involved) or a data table of your own design if one is not provided. All tables should have an appropriate title and headings. All data should have units and associated error estimates (either $\frac{1}{2}$ least count or standard deviation, as applicable). The calculations should contain all equations used in the course of the experiment. Variables appearing in the equations should be defined and their units given. Show at least one detailed example calculation for each equation (including error propagation calculations).

IV. Discussion: This section should be written in paragraph form and must account for the observations and data you obtained from the experiment. You should summarize your results and relate them to the physics concepts that you know. The discussion page in the lab handout may contain concepts to consider as you write this section.

V. Conclusion This section of the lab report describes what you have learned in the experiment. Summarize your observations and results. If the laboratory involves the determination of an unknown, include the unknown number and the results that you obtained. Use this section of the lab report to discuss the purpose of the experiment. Include any sources of errors that you encountered, the reliability of the data, additional investigations that you might suggest, and the relationship between your discoveries and physical principles, theories, and concepts.

TOPICAL OUTLINE

<i>Week</i>	<i>Date</i>	<i>Lab</i>
1	1/17/08	Intro Session, Safety Talk, Lab Notebooks, Lab Reports, Uncertainties and Error Propagation
2	1/24/08	Measurements - Mass, Volume, and Density
3	1/31/08	Acceleration Due to Gravity
4	2/7/08	Projectile Motion
5	2/14/08	Conservation of Momentum
6	2/21/08	Collisions of Elastic Spheres
7	2/28/08	Conservation of Mechanical Energy
8	3/6/08	Simple Pendulum
9	3/20/08	Atwood's Machine
10	3/27/08	Hooke's Law – Springs
11	4/3/08	Vertical Resonance Tube
12	4/10/08	Specific Heat and Calorimeter
13	4/17/08	Mechanical Equivalent of Heat
14	4/24/08	Make-up Lab Period

GENERAL INFORMATION

The schedule and procedures in this course are subject to changes by the instructor which will be announced in class.

CLASSROOM DISTURBANCES:

As a student you have the right to learn as much from the discussions and experiments as possible. It is incumbent on each student to respect the rights of others. Therefore, I reserve the right to lower the grade or dismiss from class anyone exhibiting improper behavior which disturbs the class. Including but not limited to: arriving late to class (tardiness), leaving early (reverse tardiness), presence and/or consumption of food and drinks, and disturbing others through talking. All pagers and cell phones must be turned off during class.

CLASS PARTICIPATION

Attendance of each scheduled lecture is **strongly** advised. As it is a requirement of the university, attendance will be taken at each class session. It is the policy of the science department that if a student misses more than 25% of the classes, he/she will automatically receive an "F" grade. Changes in the class schedule, information on coursework, exams and other notices will be given in the lectures. It is **your** responsibility to keep up-to-date with these changes.

MISSED EXAMS OR ASSIGNMENTS

Be responsible for you own education. If you miss a lab there **may** be no opportunity to make the lab up depending on the section of lab in which you are enrolled. Under no circumstances will due date extensions be given for the laboratory reports. **Points will be deducted for lab reports that are turned in late.** If you miss a lab, you must be able to confirm you excuse with legitimate documented evidence.

Ask questions and get involved in class discussions. Your participation and willingness to learn will be used as an additional grade determination in borderline situations.

ACADEMIC INTEGRITY POLICY

Academic Integrity is valued at Robert Morris University. All students are expected to understand and adhere to the standards of Academic Integrity as stated in the RMU Academic Integrity Policy, which can be found on the RMU website at www.rmu.edu. Any student who violates the Academic Integrity Policy is subject to possible judicial proceedings which may result in sanctions as outlined in the Policy. Depending upon the severity of the violation, sanctions may range from receiving a zero on an assignment to being dismissed from the university. If you have any questions about the policy, please consult your course instructor.

Copying material from the internet and submitting it as your own work is unacceptable. This is viewed as plagiarism and will result in no credit for the assignment. It is encouraged that students form study groups and work together to understand the course material, but each student is responsible for doing his/her own work. Copying work from another student is viewed as plagiarism, does not display the required understanding of the material, and will result in no credit for the assignment. If you are unfamiliar with the definition of plagiarism, then I suggest that you refer to any number of excellent online sources such as:

http://www.depts.drew.edu/composition/Academic_Honesty.htm 2008

<http://departments.kings.edu/celt/infoliteracy/helpstop.html> 2008

Students may not collaborate with any other individuals on work turned in for this course, except when such collaboration is explicitly permitted by the instructor. This policy applies specifically to homework and worksheets. *While I suggest that students work together in study groups in order to enhance their understanding of the course material, copying another student's homework or worksheet answers constitutes cheating.* Students may not turn in work for credit in this course that has also been turned in for credit in another course, or work that substantially consists of material turned in for credit in another course.

SPECIAL LEARNING OR PHYSICAL ACCOMMODATIONS POLICY

Students who may be eligible to receive learning support or physical accommodations must contact the Center for Student Success at 412-262-8349 to schedule an appointment with a counselor and to learn more about accommodation procedures. To receive accommodations in this course, arrangements must be made through the Center for Student Success.