First Level Laboratory

(Students of the Faculty of Science
According to the Credit hours system)

Assiut University

Physics Department

LABORATORY MANUAL

Phys. 100

Mechanics and Heat

First Year – Faculty of Science

Fall Semester

Academic Year 2009 - 2010

List of Experiments

Dear Student

Welcome to the **Fundamental Physics Lab.** wish you a valuable and interesting study and a success in the course. Enjoy learning Physics with us just as you enjoy your life. The following are the Lab regulations that you have to follow:

Before attending your laboratory session, you should always read the experiment you are going to do. Be aware that the pre-Lab. reading enables you to understand well basics of the experiment and while attending the class you can do the experiment correctly. Information given in the first few Labs. will be much more detailed than that of the next subsequent Labs; many of the laboratory techniques you learn will be used repeatedly. The only acceptable way to demonstrate your experimental results in graphical form is that by "Excel" computer program. In the first Lab. session a discussion about the Excel as well as how to use the most common tools of your experiments, the Vernier Caliber, Micrometer and Spherometer etc, will be given. As you perform the Labs, your laboratory skills will be improved and you should be less dependent on exact instruction from the Lab. Manual.

Student attending the Lab. late by more than10 minuets will **Loose** the corresponding two marks. Student late by more than 15 minutes can not attend the Lab. and he/she will be considered **Absent**. Absence of 25 % of the Lab. sessions may prevent attending the final exam. In such a case your final grade of the Lab. work is zero.

Be aware that **Cheating** during Exams. and submitting experimental results which is not yours will be strongly punished according to the university regulations.

Be sure to organize your work. This will save you a great deal of time and frustration. The 3 hours Lab. time can be subdivided as:

25-30 min	General discussion
80-90 min	Conducting the experiment
15-20 min	Drawing graph by Excel
15-20 min	Answer questions
15-20 min	Correction and evaluation

Before leaving the Lab. you have to correct and evaluate your work by the assistant. Be sure that your grade, in addition to the assistant name, signature and date of attending the Lab., have been recorded in your manual and in the files of the Lab. Six marks out of 10 marks for each experiment (A sum of 100 marks for the 10 experiments of the Lab.) are given for the experimental work including **Performance**, **Lab. attitude** and **Accuracy**. Two marks are given for the **attendance**. Other two marks are given if you **correctly answer questions** that can be found at the end of each experiment. The total grad will be considered during the final course evaluation. You have to ask about the experiment you have to do in the next Lab. session in order to follow the exact way to do the experiment correctly.

A Mid-Term Exam. will be organized after the first five weeks of the semester. Time and date of Exam will be announced in the proper time. In addition, student should be ready for Quick Quizzes during any sections.

Using Lab. equipment in the correct way is your responsibility. You have to think twice before connecting power to the set up. Damage of any of the experiment components should be substituted by the student without delay.

Food or drinks is not allowed. Please keep the experiment board and the Lab. table clean and in order.

By performing this Lab., you will learn:

Fine measurements using different tools,
How to confirm some important laws and concepts of fundamental physics,
Some properties of mechanical waves,
Difference between linear motion in resistive and nonresistive media,
Examples of periodic motion,
Thermal properties of solids,
Fundamental laws of geometrical optics,
Accurate measurement of electrical resistances and Earth's magnetic field

Finally: We are constantly trying to improve the quality and instructional utility of your Labs. If you can think of any modification to the equipment or clarification to the Lab. manual please let us know. Your opinion is extremely important to us so, please do not hesitate to present your suggestions to your instructor or assistant.

Study of Basic Physics Concepts in this Lab. will be much enjoyed, Good Luck

Completing his/her Study in this Lab.,

Student Should Acquire the Following Achievements

1- *Acquire Discipline, both attending the Lab. and accomplish duties in time.*

2- *The ability to understand and analyze scientific texts written in English.*

3- *Learning the principles and the aim behind each experiment.*

4- *The ability to contribute in a useful discussion, use logic and correct reasoning and avoiding memorization.*

5- *Able to expand his/her knowledge through addition reading and be familiar with using references.*

6- *Able to handle, plotting, data statistics and fitting.*

7- *Learn how to reach a clear conclusion after analyzing and discussing results with his/her instructor.*

8- *The ability to communicate through the internet, the Lab. is equipped with these facilities.*

9- *Learn how to work in a team.*

الأهداف المطلوب تحقيقها لطلاب معمل الفرق الاولى والاعدادية

قسم الفيزياء – كلية العلوم – جامعة أسيوط

عند اتمام الطالب لدراسة للفيزياء العملية بهذا العمل تتحقق له الأهداف التالية:

1- تبني ثقافة الانضباط سواء في الحضور أو في أداء المهام المختلفة في وقتها.
2- القدرة على فهم واستيعاب نص علمي مكتوب باللغة الإنجليزية.
3- تعلم المبادئ الفيزيائية التي تبنى عليها نظرية عمل كل تجربة والهدف من اجرائها.
4- القدرة على المشاركة في نقاش مفيد واستخدام المنطق وإعمال العقل للتوصل للنتائج وعدم اللجوء للتكرار والحفظ.
5- القدرة على تنمية المعارف والإدراك وتنمية الرغبة في قراءات اضافية واستخدام المراجع.
6- القدرة على التعامل مع البرمجيات والتحليل الاحصائي وموائمة النتائج ورسمها.
7- تعلم التوصل إلى خلاصة واضحة بعد تحليل ومناقشة النتائج مع الأستاذ.
8-التواصل من خلال شبكة المعلومات.
9- التعود على العمل ضمن فريق.