

UNIVERSITY OF KENTUCKY
DEPARTMENT OF PHYSICS AND ASTRONOMY
PHYSICS 213 LABORATORY
COURSE SYLLABUS
SPRING 2003

1. **PURPOSE:** This document provides detailed information regarding the Physics 213 laboratory course. This laboratory will provide an experimental environment where student research teams will be given the opportunity to explore the theory, concepts and physical phenomena covered in Physics 213 lecture and recitation, in a hands on, small group environment.

2. **OBJECTIVES:**
 - a. Develop an understanding of selected physical phenomena explored in a laboratory setting.
 - b. Develop an understanding of precision and accuracy in experimental work and how uncertainties in measurement effect the uncertainties in experimental results.(calculus based error propagation)
 - c. Enhance your capabilities in creating and analyzing graphical information.
 - d. Exercise and enhance technical writing skills.
 - e. Exercise and enhance leadership and management skills in a small research team model.

3. **SCOPE:**
 - a. The lab exercises, in general, follow a similar path as that used in physics 213.
 - b. Subjects may be introduced in lab that are not covered in Physics 213. Students should always be prepared by carefully reviewing the subject matter before entering the lab.

4. **MISSION:** The PHY 213 Instructional team will ensure that every student is given the opportunity to master the course objectives and achieve their full potential while seeking to improve the course pedagogy to better meet the needs of all students, both present and future.

5. **EXECUTION:**
 - a. The Instructional team is composed of the following members, each with specific duties and responsibilities with respect to the conduct of the laboratory.
 - i. Instructional Lab Specialist
 - (1) Provide long term vision for Instructional Lab Program.
 - (2) Provide and coordinate resources including budget, space, personnel and dollars.

- (3) Train and supervise teaching assistants
- (4) Supervise and coordinate weekly meetings/seminars.
- (5) Supervise lab grading practices.
- (6) Mediate student to TA and student to student disputes.
- (7) Develop and publish lab manuals and materials
- (8) Develop new experiments and test new equipment
- ii. Senior Lab Teaching Assistant:
 - (1) Setup and test all lab equipment for each lab
 - (2) Coordinate equipment needs for make up labs
 - (3) Provide weekly summaries of equipment use and trouble shooting.
- iii. Lab Teaching assistants:
 - (1) Provide a brief introduction to each Lab.
 - (2) Serve as an advisor to the student research teams in each section.
 - (3) Emphasize connectivity with lecture topics
 - (4) Grade all written work IAW weekly Lab seminars/ meetings and this Syllabus.
 - (5) Assist in the development of new Labs.
 - (6) Provide input to the Lectures regarding Lab questions on exams
 - (7) Provide feedback on course development issues.
 - (8) Mediate intra team disputes
 - (9) Maintain a daily journal of lab activities (experimental note book)
- iv. Students:
 - (1) Prepare Pre Labs and quizzes individually.
 - (2) Be familiar with your assigned role and associated duties.
(Principle Investigator, Researcher, and Skeptic.) These role will rotate each week.
 - (3) Fully participate in each lab and the report development process.
 - (4) The responsibility for learning is yours alone.
 - (5) Use the combined power of your research group efficiently.
- b. Other means of Assistance
 - i. TA , Lecturer, Office Hours and appointments
 - ii. Email and Phone conversations.
 - iii. Physics Resource Room
 - iv. Private Tutors.(Ask at the Main office (CP 177) see Joanna. Plan ahead they book early.)

6. ADMINISTRATION AND LOGISTICS:

- a. Lab Manual, "Physics 213 Laboratory Manual for General Physics, Spring 2003", Ellis. Available at Johnny Print . 22 Jan 2003
- b. TI 82, 83, or 83+ Calculator is required , TI 85/86 or 92 will work with TI Sonic Ranger but not all experiments under development. Each team must have at least one of the required series calculators.
- c. Lab Computers: Each Lab is equipped with 8 Laptop and two to four desk top

computers.

- i. All laptops are networked and have MS Office Suite 2000 installed.
- ii. Programs and data can be transferred to and from your TI Graphing calculator, using the TI Graph link cable provided.
- iii. When not in use by you these computers are analyzing data collected by several radio telescopes as part of a distributed processing program (SETI).
- iv. Modifying these systems in any way is forbidden and could result in loss of credit for the current lab, for your lab group.
- v. You are encourage to begin writing your report when appropriate during your Lab time and then emailing your work to another location for further action.
- vi. Leave the Lab computers open, on and facing the lab entrance when you depart the lab.
- vii. Use caution when moving the computer around on the bench top and do not leave them under a the water faucet on benches so equipt.

d. Lab Schedule

Week	Dates	Experiment	Title
1	27 - 31 Jan	1	Electric Charge
2	3 - 7 Feb	2	Electric Fields
3	10 - 14 Feb	3	the Oscilloscope
4	17 - 21 Feb	4	Basic Circuits parts I &II
5	24 -28 Feb	5	Basic Circuits Part III
6	3 - 7 Mar	6	The RC Circuit
7	10 - 14 Mar	7	Mapping Magnetic Fields
8 Spring	17 - 21 Mar	Break	
9	24 - 28 Mar	8	the Magnetic field produced by an Electric Current
10	31 Mar - 4 Apr	9	Electricity and Motion: Induced EMF
11	7 - 11 Apr	10	The Current Balance