

Syllabus
PH202
(Calculus-Based Physics II)
Fall 2004

INSTRUCTOR:

- Dr. Kiho Kim
Assistant Professor of Physics
- contact info:
 - Office: ILB 103
 - Phone: 460-6224 (Ext. 2133)
 - Office Hours: T 10:00 – 11:00 A.M. & MWF 10:00 - 11:00 P.M. (Other times can be arranged by appointment.)
 - Email Address: kkim@jaguar1.usouthal.edu
 - Teaching Website: www.usouthal.edu/physics/lectures/kkim

COURSE DESCRIPTION:

- Second semester of a two-semester introductory course in calculus-based physics with laboratory. This course covers electrostatic fields and Gauss' law, electric potential, electric circuits, magnetic fields, Ampere's law, Faraday's law, inductance, Maxwell's equations, electromagnetic waves and optics.

GOALS & OBJECTIVES:

- To learn the principles of electricity, magnetism, electromagnetic waves and optics and to develop the analytical thinking and problem solving skills necessary to apply these principles to physical systems using calculus

CLASS:

- Lecture Hours: MWF 12:05 - 12:55 (ILB 240)
- Credits: 4
- Textbook: "Physics for Scientists & Engineers", Fifth Edition, Serway & Beichner

CLASS ATTENDANCE:

- Attendance will be taken each day. A bonus credit of 3% will be given for perfect attendance. Attendance record will be used to judge student's efforts.

SPECIAL NEEDS:

- Students with disabilities who are registered with the Office of Special Services should notify the instructor immediately. Accommodation will be arranged between the Office of Special Services and the instructor.

FINAL GRADE:

- **Laboratory Grade : 10%.** One must pass the lab to pass the course. Any laboratory missed or graded less than a “C” must be made up. It is the student’s responsibility (not the instructor’s) to reschedule missed labs. Those who have previously completed the course with satisfactory laboratory grades may request to have the laboratory waived. Laboratory waiver forms must be processed within the first week of class. See the Physics Dept. secretary for filing and approval of laboratory waivers.
- **Three Tests : 15% each.**
- **Quiz: 10%**
- **Final Exam (Comprehensive): 35%.**
- **Exam Policies:**
 1. You may take the make-up exam only if you have submitted a valid, written excuse to the instructor within 48 hours of the missed exam and the instructor’s permission is granted.
 2. Students will be allowed to bring a 2”×5” card with whatever they wish to write upon it.
 3. *Dishonesty on any examination will result in a failing grade for the course.*
- **Grading Scale:**
 - A: 90 - 100 %
 - B: 80 - 89 %
 - C: 70 - 79 %
 - D: 60 - 69 %
- **Note:** In case of rescaling, the instructor has all the rights to change the grading system.

HOMEWORK:

- The key to success in this class is the regular completion of assigned problems at the end of each chapter. Students should thoroughly read the text material and understand the examples in each chapter before working the homework problems. You are also strongly advised to work the problems during the week they are assigned. Although homework problems will be assigned, they will not be collected. However, the weekly quiz will always contain a problem from the previous week’s homework.
- **Computer Assignments:** Several computer based homework problems will be assigned in class. The Math-Physics computer center is located in ILB 245.

COURTESY:

- Please turn off all cellular phones, pagers, etc. before coming to classes.

CLASS SCHEDULE: This is tentative, and therefore, this can be changed.

Week	Chapter	Homework	Laboratory
1	23	(Ch. 23) 8, 10, 19, 20, 28, 34, 40, 46, 48, 50, 60, 62, 68, 72	Introduction to Lab (Check the laboratory schedule with your lab instructor)
2	24	(Ch. 24) 8, 9, 18, 20, 28, 36, 42, 48, 51, 53, 55, 58, 60, 64	No Labs-Labor Day Holiday
Sep. 6	No Class: Labor Day Holiday		
3	25	(Ch. 25) 5, 10, 20, 21, 28, 38, 48, 58, 71	Lab 1
4	26	(Ch. 26) 2, 10, 14, 22, 28, 34, 38, 46, 47, 50, 54, 62, 76	Lab 2
Sep. 22	EXAM 1 (Chapters 23 – 26)		
5	27	(Ch. 27) 2, 10, 22, 24, 26, 30, 34, 42, 48, 66, 70	Lab 3
6	28	(Ch. 28) 4, 6, 14, 13, 18, 22, 28, 32, 34, 62, 72	Lab 4
7	29	(Ch. 29) 8, 10, 16, 18, 28, 30, 42, 46, 63, 66	Lab 5
8	30	(Ch.30) 8, 14, 17, 19, 28, 30, 34, 40, 44, 50, 60, 61, 69	Lab 6
Oct. 20	EXAM 2 (Chapters 27 – 31)		
9	31	(Ch. 31) 4, 9, 10, 11, 18, 20, 26, 28, 40, 42, 52, 60, 66, 70	Lab 7
10	32	(Ch. 32) 8, 14, 18, 28, 34, 40, 47, 48, 54, 64, 68, 78	Lab 8
11	33	(Ch. 33) 6, 12, 16, 24, 28, 33, 40, 46, 50, 52, 58, 66	Lab 9
12	34	(Ch. 34) 8, 10, 20, 24, 26, 30, 42, 48, 54, 58, 72	Lab 10
Nov. 17	EXAM 3 (Chapters 32 – 35)		
13	35	(Ch. 35) 4, 14, 16, 18, 31, 38, 48, 64, 66, 68	Lab 11
14	36	(Ch. 36) 4, 14, 24, 38, 43, 66, 70	Lab 12
15	37, 38	(Ch. 37) 4, 12, 18, 22, 35, 37, 50, 60, 66 (Ch. 38) 2, 10, 22, 32, 42, 50, 58	
Dec. 7	Last day of Classes		
Dec. 10	Final Exam: 1:00 – 3:00 P.M.		

Laboratory Syllabus for
PH 114/115 & 201/202
Fall 2004

Instructor: Mrs. Harpen , Lydi
Text: Physics Experiments for PH 114/115 & 201/202
Supplemental Text: Student's Text Book
Office hours: W (3:30-4:30 pm)

GENERAL & ATTENDING POLICIES

1. The class consists of 2 hours & 50 minutes of Physics lab, including measurements of experimental data and a written clear, neat and well-organized lab report. (See sample write-up of the lab report.
2. Final reports –of the current experiment and of the previous week's graded one- must be turned in at the end of the lab class.
3. Students working in pairs (2-3 per group) may share data. However, the lab report must be done individually. Each student is expected to participate in performing the experiment. Do not plagiarize from a friend's old lab report. Identical or similar reports will receive no credit for that section of the report (see sample write-up of the report).
4. All labs must be attended. Any unexcused absence will result in a 0 for that lab.
5. A make-up lab is possible only during the week in which the equipment and instructor are available. Permission must be obtained from both instructors to make up a lab. Remember that both reports be turned in to the attending instructor before leaving the class.
6. Students with questions regarding the lab can get help during the instructor's office hours.
7. Before leaving, please clean up the work station.

NOTE: It is important that students come to the lab with the following preparations:

1. Finish the preliminary assignment, ready to be turned in to the instructor at the beginning of the lab.
2. Introduction and Theory should already be written.

GRADING POLICY

Lab report grade break down: 10 points to preliminary assignment and 90 points to lab report (see sample write-up).

The numeric grades of each experiment will be averaged at the end of the semester and given to the lecture instructor to be included in your overall physics grade. There will be no final lab test at the end of the semester.

According to the physics department policy, each student must pass the lab in order to receive a passing grade in the course. The passing grade of the lab is an average grade of 60.

Any student with a qualified handicap through the Special Student Services office requiring accommodations should talk with the instructor.

SAMPLE LAB REPORT

The lab report must be written in pencil with standard 8 1/2" X 11" paper. It should be in a laboratory folder. For neatness, **use a ruler for tabulating and graphing data.**

The procedure outlined below will be used for all experiments in the PH 114/115 series and PH 201/202 series. Order of the procedure must be followed.

TITLE

Title of the experiment and lab number

I. Introduction (5 pts.)

Give a concise statement of what the purpose of the laboratory for that week.

II. Equipment (5 pts.)

List the equipment and specify its least count (smallest division of each instrument to be used). Also needed is sample characteristic appearance if necessary.

III Theory(10 pts.)

Discuss the physics concepts of the experiment. Include all equations to be used in the calculations section. Explain each variable or symbol appearing in the equation; also a simple diagram can be helpful to define variables.

IV Data (25 pts.)

State in sequence how the experiment is done (i.e. data is collected); also indicate the number of trials each quantity is measured. Specify the instrument used in each case.

Present data in tables with a title and a number. Indicate column heading with the correct units. Determine the average of each measured quantity along with its standard deviation,

$s_{n-1}, \frac{3\sigma_{n-1}}{\sqrt{N}}$, 1/2 l.c, estimated uncertainty (larger than 1/2 l.c), absolute and relative uncertainties. All of these should be presented in table (See table)

Example: Table - diameter measurements

<u>TrialD (cm)</u>	
1	10.0
2	10.1
3	10.9
4	10.2
5	10.3
average	10.3
$1/2 l.c0.05$	
estimated	0.1
s_{n-1}	0.35
$\frac{3\sigma}{\sqrt{N}}$	0.47
absolute	0.47
relative	4.5%

V. Calculation and Error Analysis (25 pts.)

Show the calculations of final results with propagation of uncertainties that are explained in experiment #2. **Do not do the calculation and error analysis in the DATA section or on the sheet where the graph is plotted.**

Show only sample calculations if repeated data are measured.

Attach an extra sheet (graph paper preferably) for graphing data. Specify all coordinate pairs on the graph.

All graphs should have title, number, and both axes (X and Y) clearly labeled with correct units.

Scale of the X and Y axes should be assigned so that details of the curve or the line are clear.

VI. Results and Discussion (20 pts.)

Reserve about 20 minutes of the lab to write your discussion. It should contain:

- A. The results that you obtained with their relative and absolute uncertainties.
- B. Compare your results with the accepted value, if it is known.

An agreement between two values having uncertainties is reached when:

1. the range of the two values overlap, or
 2. the difference of the two is smaller than the sum of their absolute uncertainties.
- C. If the agreement is not achieved, identify the principle source of error (possible reasons account for the discrepancy.) Discuss ways to improve accuracy in the data.