BOROUGH OF MANHATTAN COMMUNITY COLLEGE
The City University of New York
Department of Science

TITLE: **GENERAL PHYSICS**

Course Code	PHY 110, Section 081
Lecture Hours Per Week	3
Laboratory Hours Per Week	2
Credits	4
Instructor	Dr. Hulan E. Jack Jr.

Websites:

General http://www.hejackjr.com;
Only for class http://www.hejackjr.com/phy110.html
Class e-mail hejackjr@netzero.com copy into "to" of your browser

DESCRIPTION

This course serves as an introduction to Physics, especially for students who are not science oriented. A selected number of basic physical ideas are carefully examined and interpreted with a minimum amount of mathematics. However, it is expected that the student will learn to read simple equations and formula, draw and interpret simple graphs, and understand numbers in scientific notation. The relevance of the scientist and his/her work to the lives of non-scientists is continually examined.

Fall 2012

OBJECTIVES

1. To provide a broad general understanding of the structure and function of the physical universe.
2. To provide a basic understanding of the principles and laws concerning mechanics, heat, sound, light , electricity, magnetism, atomic and nuclear physics and relativity theory.
3. To provide a basic understanding of the "Scientific Method" and measurements through the execution of physical experiments.
4. To realize that science is a human, cultural, political and sociological activity.

Required TEXT: ***the Physics of everyday phenomena: a conceptual introduction to physics,*** 7th Edition; by Griffith W. Thomas, 2011
http://everydayphysics.heyclick.net/ (By Google Search)

MEETINGS:

Monday	8:00 - 9:40 AM	N772	Lecture and Exams
Wednesday	8:00 - 8:40 AM	N772	Lecture and Exams
Thursday	8:00 - 9:40 AM	N515	LAB

1. GRADES

Your Grade will be determined as follows:

Homework	25%
Labs	25%
Midterm	25%
Final	25%
Grand Total	**100%**

Details of Grade Determination for Homework and Lab Reports

Homework	**It takes 10 HOMEWORK PROBLEMS to get all 25%** 4 problems from Ch1- 8; 4 problems from Ch 9 - 13; 2 problems from Ch 14-18	
Grade =	0.7 * (Sum of Best 5) /5 + 0.3*(Sum of Next 5)5	
LAB Reports	Best 5 out of **7** or more	Best 5 of **6** or less
Grade =	1.0*(Sum of best 5)/5	0.7*(Sum of best 5)/5

**** To avoid abuse of this system note that the grade drops when you turn in less than the specified number of homework problems or lab reports.***

2. LAB REPORTS

1. Lab reports are due the following meeting of the lab. **LATENESS**: 10 points off after 2 weeks, 20 points off after 4 weeks.
2. Lab reports should be neat and readable.
3. When the experiment contains an **Optional** section, that **is required** as part of the report.
4. Submit each report separately with all of its sheets stapled together and all pages as shown in layout below.
5. **Discussion of Errors**- **"Human error" is meaningless!** Answer as if you were going to redo the experiment next week and (1) you wanted to improve the results and, (2) you had access to additional equipment.
6. Show all **calculations** - write formula, then substitute numbers, get answer with significant figures and units. For example

   Volume = LxWXH = 12.1cm x 4.6cm x 1.6cm = 88.3 cm^3

3. HOMEWORK PROBLEMS

1. First and foremost, homework problems handed in must be neat.

   "If I can't read 'em**, I will not grade 'em**'." Neatness involves the following:

   1. Handwriting must be legible. Typing is okay but not required.
   2. The layout of the arguments and the development must be sensible and reasonably logical .

2 To get a 100, **or more**, on homeworks, solutions must have statements of definitions and physical principle (laws) appropriate to the problem in mathematical form (equations, formulas), along with some explanatory picture(s) or sketch(s) if appropriate. These should be referred to in your solutions, even when direct calculations are not needed. When there are calculations, follow 6 in Lab Reports, above.

For more detail see http://www.hejackjr.com/Index1/A_Simple_Layout_and_Method_Solving_PhysicsProblems.pdf.

3.Submit each homework problem separately with all of its sheets stapled together and all pages following layout below.

Homework Layout
(each page, even on same sheet)

Last Name, First Name Page #
Partners (*1st page only*)
Chapter # Problem #

Example

Brown, Charlie 1
Partners Mary Jones, Harry Smith
Chapter 2 Problem CP4
or
02-CP4

LAB Report Layout
(each page, even on same sheet)

Last Name, First Name Page #
Partners *(1st page only)*
LAB Name

Example

Brown, Charlie 2
Acceleration due to Gravity- Free Fall

4.**LATENESS :** Homework will not be accepted after due date! On that date solutions will be discussed in class and posted on the class website http://www.hejackjr.com/phy110.html

4. Working Together

Working with others, in person, by phone, by e-mail, or any combination, provides a much more powerful learning environment than working alone by yourself. If working with others on a homework problem or a lab report, (1) each person must hand in their own version **and , (2) list their partners**. When I see papers that look too much alike, I immediately suspect cheating. **If I see a list of the same collaborative partners on the person' s papers, then I dismiss cheating.**

5. Cheat Sheet

A cheat sheet consisting of 2 sheets of 8.5"x11" paper is allowed on Mid Term and Final. You should build your cheat sheet as you go along during the term. Adding new things, removing old things that you are comfortable with. This makes the cheat a valuable study tool.

6. **Example of Detailed Calculations** from Old Lab 2- Acceleration Due to Gravity - Free Fall Apparatus

DATA TABLE	Height 1 Measurements	Height 2 Measurements	Height 3 Measurements
HEIGHT d (meters)	(53.8 cm) 0.538m	(75.0cm) 0.75 m	(96.3 cm) 0.963 m
TIME (Trial 1- seconds)	0.319 s	0.391 s	0.436 s
TIME (Trial 1- seconds)	0.331 s	0.392 s	0.438 s
TIME (Trial 1- seconds)	0.324 s	0.399 s	0.436 s
TIME (Trial 1- seconds)	0.340 s	0.415 s	0.440 s
AVERAGE TIME t_{avg}	0.329 s	0.399 s	0.438 s
CALCULATED VALUE OF g (meters/second^2)	9.97 m/s^2	9.41 m/s^2	10.04 m/s^2

Name	Definition-Formula	Substitute Values	Result
$t_{1\ avg}$	$t_{1avg} = \frac{1}{N}\sum_{n=1}^{n=N=4} t_n$	$= \frac{0.319s + 0.331s + 0.324s + 0.340s}{4}$	$= 0.329s$
$t_{2\ avg}$	$t_{2\ avg} = \frac{1}{N}\sum_{n=1}^{n=N} t_n$	$= \frac{0.391s + 0.392s + 0.399s + 0.415s}{4}$	$= 0.399s$
$t_{3\ avg}$	$t_{3\ avg} = \frac{1}{N}\sum_{n=1}^{n=N} t_n$	$= \frac{0.436s + 0.438s + 0.436s + 0.440s}{4}$	$= 0.438s$

$g_1 = 2d/t_{1\ avg}^2 = 2x0.538m/(0.329s)^2 = 9.94\ m/s^2$

$g_2 = 2d/t_{2\ avg}^2 = 2x0.750m/(0.399s)^2 = 9.43\ m/s^2$

$g_3 = 2d/t_{3\ avg}^2 = 2x0.963m/(0.438s)^2 = 10.03\ m/s^2$

g_{avg} $g_{avg} = \frac{1}{N}\sum_{n=1}^{n=N} g_n = \frac{9.94\,m/s^2 + 9.43\ m/s^2 + 10.03\ m/s^2}{3} = 9.81\,m/s^2$

%Error $\%\,ERROR = \frac{|Accepted\,Value - Experimental\,Value|}{Accepted\,Value} x100 = \frac{|9.80 - 9.81|}{9.80} x100 = \frac{0.01}{9.80} x100 = 0.1\%$

While this is tedious, it gets you accustomed to good and meaningful calculations. In real life, numbers by themselves have no meaning. Only when put into the context of definitions and formulas with units do they become meaningful.