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This document may be revised.

PHYS 216
Electromagnetism
Mount Holyoke College – Fall 2009

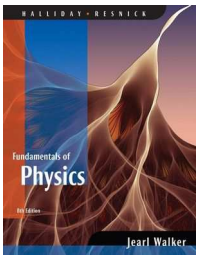
Meeting Times:
(LECTURE) **Cleveland 003L, MWF 11:00a – 11:50a,** (4th-HOUR) **Th 10:00a-10:50a ,** (LAB) **Carr G12, 1:15p-4:05p (01 on M) or (02 on T)**

Instructor: **Rob Salgado** **Visiting Assistant Professor of Physics** Office: **Kendade 215** Voice: **(413)-538-2816**	Email (the best way to contact me): **rsalgado@mtholyoke.edu** Instant-Messengers: AOL, MSN[hotmail], Yahoo, Skype: **mhcphyrob** (do *not* email here)	Office hours: **-to be announced**

Lab Instructor: **Christine DeRunk (cderunk@mtholyoke.edu), Kendade 207, (413)-538-2029**

Catalog Description:

PHYS 216 – Electromagnetism (4 credits) - [67666]
Topics include: electromagnetism, emphasizing fields and energy; electrostatics; electric circuits; magnetism; induction; and electromagnetic radiation. Additional topics chosen according to the interests of the class and instructor.
[Prerequisite: PHYS 115; Mathematics 202.]



Required Textbook:

"Fundamentals of Physics (8th ed)", D. Halliday, R. Resnick, J. Walker [Wiley (2008), ISBN 978-0-471-75801-3]

Optional supplements (featuring review summaries and worked problems) that may be useful to you:
various Schaum's Outlines for Physics *[the prefix* **http://proxy.mtholyoke.edu:2048/login?url=** *is needed for off-campus access]*
http://proxy.mtholyoke.edu:2048/login?url=http://site.ebrary.com/lib/mtholyoke/Doc?id=5002213
http://proxy.mtholyoke.edu:2048/login?url=http://site.ebrary.com/lib/mtholyoke/Doc?id=10015295
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http://proxy.mtholyoke.edu:2048/login?url=http://site.ebrary.com/lib/mtholyoke/Doc?id=10045493

Electronic Materials:

I will maintain a website (**http://www.mtholyoke.edu/courses/rsalgado/216/**)
that links to homework assignments, pre-class assignments (via **ella**), worked-solutions (on **ella**), electronic-whiteboard notes, and handouts. (These materials are not a substitute for regular attendance, participation, and problem-solving.)

Course Goals:

A. To develop the "field" concept in physics.
B. To reinforce important concepts in physics and mathematics.
C. To further develop physical intuition, mathematical reasoning, and problem solving skills.

Course Requirements:

Come to class **ON TIME, AWAKE, and ALERT (to the physics topic under discussion)**.
Attendance is **REQUIRED** for Lectures, for Labs, and for 4th-hours.
(With advanced notice, a particular 4th hour may be used for a lecture or for an examination.)
Come to class PREPARED and EQUIPPED, having read or written any assignments.

Grades are roughly weighted as follows: ***** means that *"You cannot earn a passing grade without this item"*

10% HOUR-EXAM #1 (during your lab section)	30% HOMEWORK (including pre-class assignments)
10% HOUR-EXAM #2 (during your lab section)	20% LAB (required*****, at most one-excused and one-unexcused missing-lab)
10% HOME-EXAM #3 (due at start of Nov 30 class)	20% CUMULATIVE FINAL EXAM (required*****)

Grades will be maintained on **ella**, and you will be alerted when a new item is posted. ***You have one (1) week to contest (by email) any grade or any missing item.*** Requests for re-grading must be accompanied by a written explanation on the item which concisely identifies what is being is contested and concisely explains (in physical or mathematical terms) why your answer is correct or why the grading is wrong. The entire assignment or exam may then be subject to re-grading, and may result in a higher total score, a lower total score, or an unchanged total score.

Homework (assigned periodically, is due in "THE BOX" by the end of class on Wednesdays):

Homework will be assigned, collected, and graded. (Late homework (penalized 15% daily, starting at the end of class) must be submitted under my door or sent as a legible scan to **mhcphyrob@gmail.com** (which is only to be used for large emails).)
Most of the learning you do in this course is done by your doing homework problems outside of class! (I am merely a guide for you.)
You are strongly encouraged to discuss the homework with other students. However, be sure that you can do the homework *by yourself* and that you present your own work. You can always ask me or my teaching-assistants for help after you have made an honest effort.

Missed exams or labs:

There are no makeup exams or labs. There are no exceptions.
If you are absent for an exam or a lab, ***within one (1) week, you must send me an email with your excuse.*** Only if that excuse is valid, your final exam will carry the weight of a missed exam, or your lab will be declared as an "excused missing lab" [which won't be averaged in to your lab grade]. Otherwise, you will get zero credit for the missed exam or lab. You are, of course, responsible for the content of any missed exam or lab. ***Be aware that some exam questions may make reference to what was done in an earlier lab!***

Alternate arrangements:

Requests for alternate arrangements must be ***made in advance*** and ***must be accompanied by an email addressed to me***.
I will reply by email with my decision on your request.

Proposed Sequence of PHYS 216 topics (subject to adjustments, as needed):

Introduction and "Quiz 0"
(Ch 13) Gravitation [NEWTON] starts 9/11
(Ch 21) Electric Charge [COULOMB] starts 9/18
(Ch 22) Electric Field starts 9/23, etc
(Ch 24) Electric Potential
(Ch 25) Capacitance
(Ch 26) Current and Resistance
(Ch 27) Circuits
(Ch 28) Magnetic Fields [LORENTZ]
(Ch 29) Magnetic Fields Due to Currents [AMPERE]
(Ch 23) [FLUX],(Ch 30) Induction and Inductance [FARADAY]
(Ch 23) Gauss' Law [GAUSS] and (Ch 32) Maxwell Equations

(Ch 33) Electromagnetic Waves and some (Ch 16) Waves
(~Ch 37) Relativity *(we will not closely follow the text)*
[EINSTEIN and MINKOWSKI]

(Ch 31) Electromagnetic Oscillations
and Alternating Current [aspects in LAB]

Mo	Tu	We	Th	Fr	Sa	
			10	11		SEP
14		16	17	18		
21LAB		23	24	25		
28 **		30	1	2		OCT
5LAB		7	8	9		
		14	15	16		
19		21	22	23		
26LAB		28	29	30		
2 **		4	5	6		NOV
9		11	12	13		
16LAB		18	19	20		
23						
**30LAB		2	3	4		DEC
7LAB		9	10	11		
14 =]			[18=19			
21=22]						

LABS:
Charges ("Sticky Tape")
Equipotentials
Circuits and Kirchhoff Laws
Ampere and Faraday
AC Circuits (Oscilloscope)
Special Relativity (Rob S.)

CFD conference (Carleton [MN])

****HourExams are in-class, during your registered lab period.**

HourExam #1
(Ch 13,21,22)

NES APS/AAPT (U. NH)

HourExam #2
(Ch 24,25,26,27)

HomeExam #3
(Ch 23,28,29,30)
given 11/23, due 11/30

Cumulative FinalExam
scheduled through the college

SC09 ?? (Portland, OR)

Some advice:

Physics is a **challenging** subject that requires your dedicated attention, but rewards you with skills that you can apply in ***any*** discipline!

Physics is **cumulative**: For example, understanding Ch 17 requires that you understand many of the chapters before it.

You must not fall behind! If you find yourself falling behind, you must get some help.

Physics is written and spoken in a **Mathematical** language.

At this stage, Algebra, Trig, Geometry and Pre-Calculus are more important than Calculus. *Review your basic mathematics NOW!*

Physics is about "understanding **relationships** between physical quantities",

which we uncover by experiment and by mathematical reasoning.

Physics is **NOT about formulas** and merely plugging-in numbers.

Formulas are often only "special cases of expressions of those relationships".

"Knowing a formula without knowing when it applies" is generally useless.

The act of "plugging-in numbers" measures your ability to do Arithmetic or to use a calculator.

The resulting number is only useful when you interpret it physically. *"The right number with the wrong physics" is just plain wrong.*

YOU CAN understand and succeed in Physics only if YOU put in the required work.

Just attending lectures and labs is not enough. Just taking good notes is not enough.
Just reading the textbook is not enough. Just memorizing formulas and definitions is not enough.
Just doing the homework is not enough. Just reading the solutions is not enough.

There are no shortcuts. ***YOU HAVE TO DO IT ALL.***