Physics 435 : Grading

11 Home Work: 30%

Discussion Section: 5% attendance

3 Midterms : 30%

Final: 35%

I have heavily weighted the homework since it's the only way of learning E&M at this level.

Jim Wiss Office Hours Thursdays and Tuesdays 6:30pm to 8:00 pm. Times posted in Schedule. Room to be announced by email. (jew@illinois.edu)

Mid Terms (in class):

Fri Feb. 28
Fri Mar. 21
Fri May 2

Home Work due Friday in HW box

Friday < 5pm => 100% credit
Monday < 5pm => 90% credit
Thursday < 11 pm => 70% credit

I hope lecture notes will be available at

T.I.S Bookstore
707 S. 6th St.
Champaign

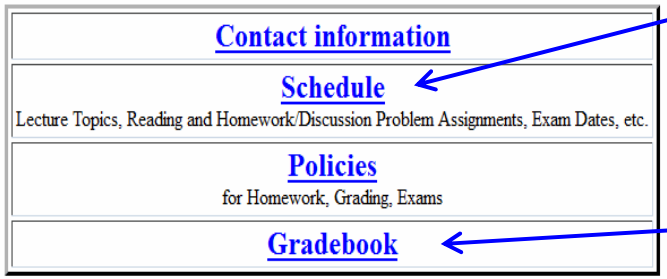
http:// courses.physics.illinois.edu/phys435/sp2014/

If you click on our home page …

Welcome to UIUC Physics 435

Electromagnetic Fields and Sources I

Spring 2014



Lecture notes& homework sets as active links

Monitor your grades

Table of Gradient, Divergence, Curl, Laplacean in different coordinate systems

Announcements:

Our text is D. J. Griffiths, Introduction to Electrodynamics (3rd edition) Most students buy my lecture notes at T.I.S. 707 S. 6th Street Champaign

Grade disputes must be resolved before last class!

I will typically hold Office Hours on Thursdays from 6:30-7:50 pm in 218 Ceramics Building which is across (on west side) of Loomis to discuss homework or exam preparation.

The first OH is on Jan. 30 2014.

Schedule

Mo	Tu	We	Th	Fr		
1/20/2014	1/21/2014	1/22/2014	1/23/2014	1/24/2014		
		1	readings	2		welcome
		GL-1	skim chp 1	GL-2		
		Intro	2.2	E-field		
		R Ch1		R2.1		
Mo	Tu	We	Th	Fr		
1/27/2014	1/28/2014	1/29/2014	1/30/2014	1/31/2014		
3		4	readings	5		
GL-3		GL-4	2.2, ~~2.2.4~~	GL-5		
Gauss Law		Divergence		Divergence		hw1-sol
			OH	HW1 due GL1		
Mo	Tu	We	Th	Fr		
2/3/2014	2/4/2014	2/5/2014	2/6/2014	2/7/2014		
6		7	readings	8		
Pot-1		Pot-2	2.2.4	Pot-3		
gradient		work&energy		Stokes 1		
D1			OH	HW2 due GL2		hw2-sol
Mo	Tu	We	Th	Fr		
2/10/2014	2/11/2014	2/12/2014	2/13/2014	2/14/2014		
9		10	readings	11		
Pot-4		Pot-5	2.3	Pot-6		
Stokes 2		E-field energy		E-field energy		
D2			OH	HW3 due Pot1		hw3-sol
Mo	Tu	We	Th	Fr		

These slides

GL Lectures

First HW due on 1/31

Solutions ~1 week after due

Welcome to Physics 435!

You saw 3 of 4 Maxwell Eqn in Physics 212

Gauss's Law : $\varepsilon_0 \int \vec{E} \cdot d\vec{a} = Q_{encl}$

Faraday's Law: $\varepsilon = \oint \vec{E} \bullet d\vec{\ell} = \frac{d}{dt} \int \vec{B} \cdot d\vec{a}$

Ampere-Maxwell $\oint \vec{B} \cdot d\vec{l} = \mu_0 \left(I + \varepsilon_0 \frac{d}{dt} \left[\int \vec{E} \cdot d\vec{a} \right] \right)$

So why study E&M further?

Great applications of crucial mathematics:

a) Vector Calculus
b) Orthogonal functions
c) Curvilinear coordinate systems

Physics beyond Phys 212

a) Differential form of Maxwell Eq,
b) E&M in materials : Bound charge & currents
c) Vector Potentials in Mech and Quant Mech
d) Wave guides
e) Radiation theory
f) Relativistic transformations of E&M fields

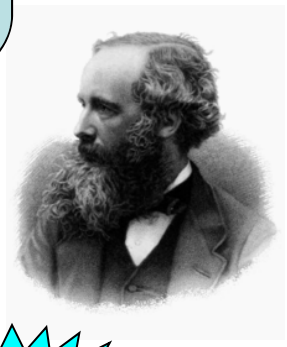
E&M is the most practical branch of classical physics

It is correct as originally written by Maxwell in 1864:

a) Relativistically
b) Quantum mechanically

E&M forms theoretical template for the successful gauge theory strong & weak interactions or the Standard Model.

Maxwell-centric history of the world



Elect

Magnet

Faraday + Ampere (1830)

E&M

Let there be light! (1864)

add QM

Quantum Field Theory (1934)

Relativity (1905)

Gauge Theories (1967)

Electroweak Unification

add QCD (1974)

Gravity?

The Standard Model