Physics 112
Electricity, Magnetism and Optics
MWF 11:00 – 11:50 AM
Spring 2012

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Text: ***Physics*** 4th ed. by James Walker. We will also use **Mastering Physics** for online homework assignments. You can sign up for **Mastering Physics** at http://www.masteringphysics.com. For this purpose you will need to purchase an access code for this particular text book.

Lab Manual You will also need the Physics 112 - General Physics: Electricity, Magnetism and Optics. It is not available in the book store. I have posted it in Moodle. **The experiments are scheduled in Hugel 123.**

Office Hours: I recommend that you set an appointment through email to meet me at an arranged time. You may also drop in any time, I will do my best to help you. Wednesday afternoon (2 to 4 PM) may be a good time for that.

Goals and Learning Outcomes:

- This course will enable you to gain a fundamental understanding of electric, magnetic and optical phenomena. It will emphasize the basic principles involved in these phenomena and their applications to solve problems.
- It will also enable you to develop and test models and communicate results in a clear and coherent way.
- Finally skills learnt in this course will readily be transferrable to others fields of study, such as chemistry, biology and other engineering disciplines.

Homework assignments: They will be posted in MOODLE every Friday. Some assignments will be given and graded on the web using **Mastering Physics** (http://www.masteringphysics.com). You need to purchase an access code (campus bookstore). Other assignments will be from the text which will be graded by student graders. ***They must be completed by the announced due dates.***
Please note:

- **Write your name, lab section and hour (like Wednesday 1 PM) on your homework when you hand in.**
- **Put your homework in the corresponding wire basket that would be placed on the front desk on the due date**
- **Late homework will normally not be accepted. Your work must be clean, well written and should not be illegible. Illegible work will not be graded.**

Reading assignments: You must read beforehand the sections announced in the syllabus to be covered in the next lecture. This will help you understand the material better.

Hour Tests There will be two hour-long tests during the class hours. The tentative dates for these tests are announced in the syllabus. An equation sheet will accompany each test. A copy of it may be posted in Moodle.

Final Exam: The final examination will be cumulative and it will be held on the date assigned by the Registrar's office.

Laboratory: You are responsible for completing all the assigned experiments at the scheduled times. If you can not make it to your schedules lab, try to come to some other lab sections for this course with the permission of the instructor of that lab section.

Feedback: Fell free to let me know your thoughts as we progress in this course. You may directly email me or if you feel shy, leave a note in my mail box without your name on it. You feedback will always be helpful to improve the presentation of the material.

Help Session: Special Instructor, **Rayan Payne (payner@lafayette.edu)** may hold two help sessions. He will get in touch with you all through bulk email confirming the details such as the days, time and room number for the meetings. Please feel free to stop by in his sessions for clarifications in the subject material and help in homework assignments.

Privacy Policy on Moodle usage: All lecture notes, homework assignments and solutions will be posted in Moodle. *Please note that these documents are for your use only. They must NOT be distributed, in any form (electronic or paper) to anybody outside Lafayette College community. Violation of this policy is against academic honesty principles.*

Grades: Your course grade will be determined by your performance in five areas:

Items	Total Points
Homework	50
Laboratory	50
Hour Test-I	100
Hour Test-II	100
Final	200
Total	500

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Syllabus

Jan	23(M)	Introduction and Electric Charge	Ch. 19:	1-2
	25(W)	Coulomb's Law and Vectors (Review)	Ch. 19:	3-4
	27(F)	Electric Fields and Shielding **(HW-1)**	Ch. 19	5-6
	30(M)	Electric Flux, Gauss's Law	Ch. 19	7
Feb.	1(W)	Electric Potential and Potential Energy	Ch. 20	1-2
	3(F)	Potential of Point Charges **(HW-2)**	Ch. 20	5-6
	6(M)	Equipotential Surfaces and Fields	Ch. 20	4
	8(W)	Capacitors and Energy	Ch. 20	5-6
	10(F)	Electric Current and Ohm's Law **(HW-3)**	Ch. 21	1-2
	13(M)	Resistors, Energy and Power	Ch. 21	3-4
	15(W)	DC Circuits-Kirchhoff's Rules	Ch. 21	5-6
	17(F)	RC Circuits and Instruments **(HW-4)**	Ch. 21	7-8
	20(M)	Magnetic Field and Forces	Ch. 22	1-2
	22(W)	Motion in Magnetic Fields	Ch. 22:	2-3
	24(F)	**First Hour Test** **(HW-5)**	**Ch. 19 to 21**	
	27(M)	Current Loops, Torque, Dipole	Ch. 22:	5-6
	29(W)	Sources of Magnetic Fields	Ch. 22:	7-8
Mar.	2(F)	Magnetic Flux and Faraday's Law **(HW-6)**	Ch.23:	1-3
	5(M)	Lenz's Law, Work and Energy	Ch. 23:	4-5
	7(W)	Applications and Inductance	Ch. 23:	6-7
	9(F)	RL Circuits, Energy and Transformer **(HW-7)**	Ch. 23:	8-10
	12(M)	**Spring Break**		

	14(W)	**Spring Break**			
	16(F)	**Spring Break**			
	19(M)	Wave Motion		Ch. 14	1-3
	21(W)	Sound Waves, Intensity		Ch. 14:	4-5
	23(F)	Doppler effects, Superposition	**(HW-8)**	Ch. 14:	6-7
	26(M)	Standing Waves, Beats		Ch. 14:	8-10
	28(W)	EM Waves		Ch. 25:	1-2
	30(F)	EM Spectrum, Energy and Power	**(HW-9)**	Ch. 25:	3-4
Apr.	2(M)	Polarization		Ch. 25:	5
	4(W)	Reflection, Images and Mirrors		Ch. 26:	1-3
	6(F)	**Second Hour Test**	**(HW-10)**	**Ch. 14 + 22-25**	
	9(M)	Mirror Equation and Ray Tracing		Ch. 26:	4
	11(W)	Refraction and Lenses		Ch. 26:	5-7
	13(F)	Eye Camera, Lenses	**(HW-11)**	Ch. 27:	1-3
	16(M)	Optical Instruments		Ch. 27:	4-6
	18(W)	Physical Optics		Ch. 28:	1-2
	20(F)	Thin Film Interference	**(HW-12)**	Ch. 28:	3-4
	23(M)	Diffraction and resolution		Ch. 28:	5-6
	25(W)	X-Ray Diffraction		Ch. 28:	7-8
	27(F)	Early Models of Atom	**(HW-13)**	Ch. 31:	1-3
	30(M)	Quantum Mechanical Hydrogen Atom		Ch. 31;	4-5
May	2(W)	Multielectron Atoms-Periodic Table		Ch. 31:	6-7
	4(F)	Last Day of Classes			