

Course:	PHY 340
Instructor	Dr. Christensen
Email:	neil.christensen.qft@ilstu.edu
Phone:	(309)438-5502
Office:	MLT 312D
Office Hours:	MWF 2:00-2:30 or by appointment
Lecture:	MWF 11:00-11:50 in MLT 307B
Recitation:	MWF 10:45-11:00 in MLT 307B
Required Materials:	Textbook: Intro. to Electrodynamics , 4th Edition, by David Griffiths
Exams:	1 Comprehensive Final

Grading

Your course grade will be based on exams and homework in the following proportions:

- 40% Final
- 60% Homework

However, if your final has a higher score than this combined score (40% Final + 60% Homework), I will give you your final score as your course grade.

Your letter grade will be determined according to the following percentages of the total possible scores:

- 90% A
- 80% B
- 70% C
- 60% D

This means that if you get full credit on all the homework (something that is attainable and I expect everyone to achieve), and at least 25% on the final, you will get a C. If you get full credit on the homework and at least a 50% on the final, you will get a B. If you get full credit on the homework and at least a 75% on the final, you will get an A.

Homework

There will be a homework assignment due every class meeting. Typically 2-3 problems from Griffith's textbook each time. This is a lot of work, so plan accordingly, but it is in line with what is done at other universities. You are also expected to read the textbook section **before** coming to class. (I suggest you read it before coming to class and then again after class before starting your homework.) In order to reach the highest level of Electrodynamics Nirvana at the end of this class, it is essential that you "meditate" on these truths (by thoughtfully reading the text and thoroughly doing the homework every time.)

All homework is expected to be turned in on time. The student will get much more benefit and be more prepared for the next lecture and the final if he/she turns homework in on time. However, at

times, a late homework can not be avoided. In these cases, you can turn your homework in late for half credit.

When you do not get full (or half if late) credit on an assignment due to incorrect or unclear solutions, you can redo the part that was incorrect or unclear and turn it back in to get full (or half if late) credit. This means, that there is no reason you should not get full (or half if late) credit on every homework assignment. Sometimes this takes several attempts. That is ok. Please keep doing it until you get it.

You can turn late homework into on-time homework by attending colloquium, physics club, astronomy club, a weekly solar-car meeting, attending lunch with the colloquium speaker or another class event. In order to take advantage of this, write the date you attended the event on your late homework when you turn it in. Such a homework will be graded as if it is on time. Every homework is essential, so no homework will be dropped. But, as discussed here, it is possible to get full credit on all the homework under any circumstance, so please do.

At this point in your career, you should be becoming proficient in writing solutions to homework problems. This is an important part of your development as a physicist. For this reason, I will require that your solutions are **legible**, **correct** and **followable**. This means, among other things, that no two equations should appear together without an explanation of what is happening between them. If you break these rules, you will get a zero on the assignment until you fix the problems. (Please don't forget to fix the problem and turn it in again. You can still get full credit on the assignment.) I will be really hard core about this until the class seems to be achieving it regularly.

Recitation

I will arrive in class 15 minutes early (at 10:45) to answer questions about the current homework or the previous lecture. Recitation is optional but if no students attend, we will discontinue recitation.

Final

The final will be comprehensive and will be based on problems from Griffiths. There will be one problem from each chapter that we covered in this class. The final will be open book.

You are required to attend the final. Only extremely good and documented excuses will be allowed for missing the final. You must discuss this with the instructor as soon as possible.

Academic Integrity

Although it is ok to discuss certain aspects of this course with other students, the final work on all assignments and exams must be your own. Homework can be done in groups according to class policies but the final homework must be the work of the student claiming credit for it.

Additionally, exams must be done by the student alone and with no help from anyone other than the instructor. Any violations will be dealt with according to university policy.

Disability

Any student needing to arrange a reasonable accommodation for a documented disability should contact Disability Concerns at 350 Fell Hall, (309)438-5853, on the web at DisabilityConcerns.IllinoisState.edu.

Counseling

Life at college can get very complicated. Students sometimes feel overwhelmed, lost, experience anxiety or depression, suffer with relationship difficulties or diminished self-esteem. However, many of these issues can be effectively addressed with a little help. Student Counseling Services (SCS) helps students cope with difficult emotions and life stressors. Student Counseling Services is staffed by experienced, professional psychologists and counselors, who are attuned to the needs of college students. The services are FREE and completely confidential. Find out more at Counseling.IllinoisState.edu or by calling (309) 438-3655.

Tentative Schedule

Each day gives the pages that should be read and the HW that should be turned in that day.

	Monday 11:00-11:50	Wednesday 11:00-11:50	Friday 11:00-11:50
Week 1 Jan 16-20	MLKJ Day	Pages 296-301	Pages 303-308 HW1: 7.1
Week 2 Jan 23-27	Pages 309-317 HW2: 7.5, 6	Pages 318-323 HW3: 7.7, 12	Pages 324-332 HW4: 7.15, 16
Week 3 Jan 30-Feb 3	Pages 333-339 HW5: 7.22, 24, 28	Pages 340-345 HW6: 7.34, 37*	Pages 356-361 HW7: 7.40
Week 4 Feb 6-10	Pages 362-367 HW8: 8.1, 2*	Pages 368-373 HW9: 8.4	Pages 374-379 HW10: 8.6, 9
Week 5 Feb 13-17	Pages 382-387 HW11: 8.11, 12	Pages 388-393 HW12: 9.2, 3	Pages 394-399 HW13: 9.8
Week 6 Feb 20-24	Pages 400-405 HW14: 9.9, 11	Pages 406-411 HW15: 9.15	Pages 412-417 HW16: 9.17*
Week 7 Feb 27-Mar 3	Pages 418-423 HW17: 9.20	Pages 424-430 HW18: 9.24	Pages 436-441 HW19: 9.30*
Week 8 Mar 6-10	Pages 442-447 HW20: 10.1, 3, 5	Pages 448-452 HW21: 10.10	Pages 453-457 HW22: 10.13, 14
Mar 13-17	Spring Break		
Week 9 Mar 20-24	Pages 458-462 HW23: 10.16	Pages 466-470 HW24: 10.19	Pages 471-475 HW25: 11.1
Week 10 Mar 27-31	Pages 476-480 HW26: 11.3	Pages 481-485 HW27: 11.6, 8	Pages 486-490 HW28: 11.14
Week 11 Apr 3-7	Pages 491-496 HW29: 11.15*, 17a	Pages 502-508 HW30: 11.20	Pages 509-513 HW31: 12.1, 2
Week 12 Apr 10-14	Pages 514-518 HW32: 12.6, 7, 8	Pages 519-524 HW33: 12.9, 10	Pages 525-529 HW34: 12.12, 13, 14, 15
Week 13 Apr 17-21	Pages 529-534 HW35: 17, 19*, 20	Pages 535-539 HW36: 12.23, 24, 26, 27	Pages 540-544 HW37: 12.29*, 32, 33
Week 14 Apr 24-28	Pages 545-549 HW38: 12.35, 37, 41	Pages 550-554 HW39: 12.39, 40	Pages 555-559 HW40: 12.43
Week 15 May 1-5	Pages 559-565 HW41: 12.45, 47	Pages 566-570 HW42: 12.49, 51, 52	HW43: 12.53, 54, 55, 57
May 8-12	Final		

* Problems marked with an asterisk have hints given below:
HW6 7.37: Use Eq. 1.99 and Prob. 1.46.

HW8 8.2: Assume I constant.

HW16 9.17: Obtain Fresnel's equations for perpendicular polarization and show that they reduce to the proper form for normal incidence.

HW19 9.30: Use

$$\langle S_z \rangle = \frac{1}{2\mu_o} \operatorname{Re} \left(\vec{E} \times \vec{B}^* \right)_z \quad \langle u \rangle = \frac{1}{4} \left(\epsilon_o \vec{E} \cdot \vec{E}^* + \frac{1}{\mu_o} \vec{B} \cdot \vec{B}^* \right)$$

HW29 11.15: Use $\beta=1-\epsilon$.

HW35 12.19: Use hyperbolic trig. identity.

HW37 12.29 part a: Use $m_A=m_B=m_C=m_D=m$ and $u_A=-u_B=v$ and $u_C=u_D=0$ in first frame.