

## **Spring 17 – Phys272: General Physics II: Electricity and magnetism and geometric optics**

### **Course goal**

Understand the basic laws of Electricity and Magnetism and Optics and learn how to apply them.

### **Instructor**

Prof. Philip von Doetinchem, Watanabe 430

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My last name is complicated to pronounce. It is an old German noble name of Dutch origin. Please do not worry about pronouncing my last name in the right way. **"von D"** is okay with me.

### **Lecture**

9:00-10:15am, Tuesday, Thursday in Watanabe 112

### **Office hours (Watanabe 430)**

Monday 2-3pm

Tuesday 10:30-11:30am

(or other times by arrangement → Please do not just show up in my office and **always** send me an email to [philipvd@hawaii.edu](mailto:philipvd@hawaii.edu) before coming)

### **Text**

"University Physics", Young and Freedman, 13th Edition, Volume 2 (course will cover ch. 21-34)

There was a typo and the bookstore is selling it as PHYS 270.

### **Prerequisites**

Physics 151 or 170 and Math 242 or 252A. Math 216 may be substituted with consent.

### **Reading**

Reading is assigned every week, and the assignment should be completed **before** the lecture so that you may ask questions and participate in class discussion. Fulfilling the reading assignments will help you during i>clicker quizzes that will happen during nearly every lecture.

### **i>clickers**

Nearly every lecture will ask conceptual questions on the material that was just covered. You will receive a point for each correct i>clicker response. Registration of i>clickers:

**i>clicker ID is found on the backside of your i>clicker**

Register your i>clicker ID on <https://laulima.hawaii.edu/iclicker>

You have to register your i>clicker during the first two weeks or I will not count your points.

**Website:** <http://go.hawaii.edu/j8M>

I am not going to use Laulima for the upload of materials and announcements, but will upload all my lecture slides to this website. The website will also announce reading assignments, homework, important dates, and any other changes or updates.

**Please comply to Student Conduct Code:**

[http://www.studentaffairs.manoa.hawaii.edu/policies/conduct\\_code](http://www.studentaffairs.manoa.hawaii.edu/policies/conduct_code)

### **Homework**

New problem sets will be given out each Tuesday unless specified otherwise. Homework is due on Tuesdays (1 week after the assignment) unless specified otherwise. A homework discussion will follow on Tuesdays one week after the assignment.

Parts of the homework have to be completed by using Mastering Physics ([www.masteringphysics.com](http://www.masteringphysics.com)). You will have to create a Mastering Physics account and register for the course (course ID: DOETINCHEMPHYS272SPRING17).

Some fraction of the problems will have to be worked on with pen and paper (hand-in). Hand-in problems have to be submitted during the break of the lecture on Tuesdays. Hand-in problems can be worked on in groups of two. These groups have to be registered with me at the beginning of the semester and cannot be changed during the semester. Both group members will get the same number of points. This only works if both group members are actually working together on the problems. The intention is to facilitate group work. The intention is not that you split up the problem. Therefore, a statement on each submitted homework has to be included that the group members worked on the problems collaboratively. This statement has to be followed by both signatures. If the signatures are missing or if it becomes clear that the group members did not work collaboratively both members will be assigned 0 points for this homework. **Please submit only one hand-in homework per group. You have to submit your individual solution for the Mastering Physics part.**

**Emailing me:** [philipvd@hawaii.edu](mailto:philipvd@hawaii.edu)

Preferably you come to my office hours to discuss questions. However, I will also try to email you back in a timely manner. Please keep in mind that sending me questions late in the evening before the due date of homework or in the night before exams will most likely not get a reply in time. **Please always check the website first before asking organizational questions. I will not answer questions that are already answered on the website.**

## Exams

Make accommodations in your schedule for the exams well before. I will not arrange for make-up exams if you are traveling or have other non-emergency or health related obligations.

## Midterms

There will be two exams during the regular course hours in WAT112 (**February 14<sup>th</sup> & March 21<sup>st</sup>**). Midterm 1 will cover chapters 21-25 and midterm 2 chapters 26-29. They will consist of conceptual questions (similar to the i>clicker questions during the lecture, but no multiple choice) and problems similar to those occurring on the problem sets. Please just bring your calculator and paper. A formula sheet will be provided. **No further materials will be allowed.**

## Final

May 9<sup>th</sup>, 9:45am-11:45am, WAT112

The final will focus on chapters 30-34, but will also have conceptual questions concerning chapters 21-29. It will consist of conceptual questions (similar to the i>clicker questions during the lecture, but no multiple choice) and problems similar to those occurring on the problem sets. Please just bring your calculator and paper. A formula sheet will be provided. **No further materials will be allowed.**

## Extra credit:

- **Presentations**

- in-class presentation for 1.5% extra credit
- presentation has to be related to electric or magnetic fields or geometric optics (ideally some type of application of course material)
- presentation cannot be longer than 7min (including questions)
- as a rule of thumb: do not prepare more than 5 slides (1 title slide, 1 slide of introduction and embedding in bigger picture, 2 slides with the actual content, 1 slide summary/conclusion/outlook)
- only 1 presentation per student
- group presentations are not possible
- presentations have to be discussed with the instructor at least once before during office hours

- **Chapter summaries**

- 5-10 pages of typed summary per chapter for 1% of extra credit per chapter
- 1inch margin, single-spaced, 12pt
- use your own words and full sentences, do not copy and paste from the book (explain in a way that you could understand it in 6months from now without going back to the book), do not just submit a list of bullet items
- include key formulas and graphics
- do **not** take screenshots from the book, but make your own sketches (e.g., you can just make a sketch on a notepad, snap a picture with your phone, crop the picture and include it in your document), use the same procedure if you do not know how to type in formulas.
- use proper highlighting and (sub)sections (do not use bold for the regular text)
- you can turn in one chapter summary per chapter
- there are no strict deadlines when the extra credit summaries have to be submitted, but all summaries have to be submitted before the final examinations
- email me your summaries as a pdf

## Grading

final:	35%
midterm 1:	25%
midterm 2:	25%
homework:	15%
extra credit: in-class i>clicker questions:	5%

Final grades will be determined based on your scores in final, midterms, homework, and i>clicker. **To pass the class only one out of the written examinations (midterm 1, midterm 2, final) is allowed to be F.**

The final score translates into the following final grade:

A+	$95\% \leq \text{score}$	C+	$65\% \leq \text{score} < 70\%$
A	$90\% \leq \text{score} < 95\%$	C	$60\% \leq \text{score} < 65\%$
A-	$85\% \leq \text{score} < 90\%$	C-	$55\% \leq \text{score} < 60\%$
B+	$80\% \leq \text{score} < 85\%$	D+	$50\% \leq \text{score} < 55\%$
B	$75\% \leq \text{score} < 80\%$	D	$45\% \leq \text{score} < 50\%$
B-	$70\% \leq \text{score} < 75\%$	D-	$40\% \leq \text{score} < 45\%$
		F	$\text{score} < 40\%$

## Student learning outcomes:

- Charge and currents,
- Electric and magnetic fields,
- Field determination for various configurations of charges and currents,
- Forces on charges and currents due to fields,
- Potential energy and potential,
- Electrical circuits (AC and DC) composed of resistors, capacitors, and inductors,
- Energy transfer in electric circuits,
- Maxwell's equations of electricity and magnetism,
- Electromagnetic waves,
- Properties of light,
- Reflection and refraction,
- Mirrors and lenses.

**Advice:**

- This is going to be a tough class for most of the students. Don't get behind or you will quite likely not be able to catch up. The difficulty level is increasing throughout the course.
- Ask a lot of questions to yourself, to your fellow students, and to me. Make use of office hours. Don't worry about asking naive questions. These are typically the best and most likely others have the same questions.
- Problems in the exam will be extremely similar to the homework. I say it again: Problems in the exam will be extremely similar to the homework.
- Copying solutions from others does not help you learn physics. You have to really understand the homework. Then you should have no problem to get a good grade. Deciding to not spend a lot of time on understanding the homework because it is only 15% of the grade is a bad idea.

January 30, 2017