

PHYSICS 272: GENERAL PHYSICS II

ELECTRICITY + MAGNETISM AND GEOMETRIC OPTICS

Spring 2021

Instructor: David Rubin, WAT 228

Time: Tu Th 9:00 – 10:15

Email: drubin@hawaii.edu

Place: Zoom

Please put “PHYS 272” in the subject line!

Please e-mail me again if I don’t get back to you within a few days.

Class Format: The class will be a hybrid of synchronous and asynchronous: basically, if you are able, please join live. (You don’t need to have your camera on or anything like that.) If you are not able to join, because of time zone issues, technology challenges, etc., I will be recording and uploading the lectures to Laulima. This will be the plan for the whole semester. I encourage you to attend class as that will be your best chance to ask questions while I’m going over the material. You can use the chat feature in Zoom to send me a question privately or publicly that I’ll then repeat to the class and answer.

<https://hawaii.zoom.us/j/94367140491> Meeting ID: 943 6714 0491 Passcode: 248540

Office Hours: After class on Zoom or by appointment.

Course Pages:

1. Laulima (tests and announcements)
2. Mastering Physics (set up an account at <https://www.masteringphysics.com> course ID: rubin20065 using access code DSCKUP-MUSIL-TWINE-FACET-TERZA-SIRES)
3. Save the link in the registration e-mail!

Main Reference:

- Young and Freedman’s *University Physics* (15th edition)

Learning Outcomes: Learn about and understand the following:

- 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.
- Simple optics.

Prerequisites: 151 or 170 and MATH 242 or MATH 252A, MATH 216 may be substituted with consent.

Grading Policy: Recitation (20%), Homework (30%),
Laulima Practice (Extra 1%), Midterm 1 (15%), Midterm 2 (15%), Final (20%).

Important Dates:

Midterm #1 Thursday, 11-Feb
Midterm #2 Thursday, 1-Apr
Final Exam Exam Period

Course Policies:

- Items are due shortly before the end of the day they are due (11:55 pm on Laulima, 11:59 pm on Mastering Physics)
- If you are unable to turn in an assignment on time due to illness or extracurricular obligations, let me know ASAP and I'll work around it.
- There will be a specific class period assigned to each test, but I'll actually post it early and give you a week. (That is, you can do the test any time during that week, but you'll have a class period "off"; you can take the test during that class period or not. It's your choice.) The tests will be open textbook and open note, but please work alone and do not use the internet, etc.
- There will be extra-credit questions on the tests.
- I tentatively plan to follow the standard cut offs, but ultimately the final grades will depend on the gaps in the distribution of scores. For example, if there's a cluster of students around 88-91%, I'll lower the grade cut offs to give the students in the cluster all A- (I will never raise the cutoffs). That way, no one misses out on a higher grade by a small number of points.

Approximate Course Outline:

Day	Lecture #	Date	Assigned Reading (Chapter)	Homeworks	Topic
Tuesday	1	12-Jan	21		Electric Charge and Electric Field
Thursday	2	14-Jan	21		
Tuesday	3	19-Jan	22		Gauss's Law
Thursday	4	21-Jan	22	HW1 (Ch 21) due	
Tuesday	5	26-Jan	23		Electric Potential
Thursday	6	28-Jan	23	HW2 (Ch 22) due	
Tuesday	7	2-Feb	24		"Capacitance and Dielectrics"
Thursday	8	4-Feb	24	HW3 (Ch 23) due	
Tuesday	9	9-Feb	25		Current, Resistance, and Electromotive Force
Thursday		11-Feb			Midterm I
Tuesday	10	16-Feb	25		
Thursday	11	18-Feb	26	HW4 (Ch 24) due	Direct-Current Circuits
Tuesday	12	23-Feb	26		
Thursday	13	25-Feb	27	HW5 (Ch 25) due	Magnetic Field and Magnetic Force
Tuesday	14	2-Mar	27		
Thursday	15	4-Mar	28	HW6 (Ch 26) due	Sources of Magnetic Field
Tuesday	16	9-Mar	28		
Thursday	17	11-Mar	29	HW7 (Ch 27) due	Electromagnetic Induction
Tuesday		16-Mar	Spring Break		
Thursday		18-Mar	Spring Break		
Tuesday	18	23-Mar	29		
Thursday	19	25-Mar	30	HW8 (Ch 28) due	Inductance
Tuesday	20	30-Mar	30		
Thursday		1-Apr			Midterm II
Tuesday	21	6-Apr	31		Alternating Current
Thursday	22	8-Apr	31	HW9 (Ch 29)	
Tuesday	23	13-Apr	32		Electromagnetic Waves
Thursday	24	15-Apr	32	HW10 (Ch 30) due	
Tuesday	25	20-Apr	33		The Nature and Propagation of Light
Thursday	26	22-Apr	33	HW11 (Ch 31) due	
Tuesday	27	27-Apr	34		Geometric optics
Thursday	28	29-Apr	34	HW12 (Ch 32) due	
Tuesday	29	4-May	34		
Final Week					Final Exam

Course Policies and Resources

Email

As mentioned above, please include “PHYS 272” in the subject line of your email. I typically receive between 50-100 emails each day, so I’ve set up my email system to divert student emails into a particular folder that I can check daily. This system only works if you include the course number in the subject line (not in the body of the email). I will make every effort to respond to you within two business days but sometimes I get really busy or I don’t see your email. If you do not hear back from me within two business days, please check that you included “PHYS 272” in the subject line and email me again reminding me of our email. I appreciate your help on this!

All important communication between student and professor should be over email so everyone has a record. If we discuss something important in office hours, send me an email following up to document that conversation so we both remember.

University Policies and Procedures

The University of Hawai'i is an equal opportunity/affirmative action institution. It is committed to a policy of nondiscrimination on the basis of race, sex, victims of domestic or sexual violence, gender identity and expression, age, religion, color, national origin, ancestry, citizenship, disability, genetic information, marital status, breastfeeding, income assignment for child support, arrest and court record (except as permissible under State law), sexual orientation, national guard absence, or status as a covered veteran. For additional details, visit the UH Systemwide Policies and Procedures Information System (PPIS) site.

Student Conduct

Review the UH Systemwide Student Conduct Code for more information. Review the Online Netiquette and Privacy Tips to prepare yourself when interacting online.

Academic Honesty

Acts of dishonesty, including but not limited to the following:

- Cheating, plagiarism, or other forms of academic dishonesty.

Cheating is an act of academic dishonesty and includes, but is not limited to:

1. use of any unauthorized assistance in taking quizzes, tests, or examinations;
2. use of sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments;
3. the acquisition, without permission, of tests or other academic material belonging to a member of the UH faculty, staff or student body; and
4. engaging in any behavior specifically prohibited by a faculty member in

the course

syllabus or class discussion.

Plagiarism is also an act of academic dishonesty and includes, but is not limited to:

- the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgement.
- It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials.
- Furnishing false information to any UH official, faculty member, or office.
- Forgery, alteration, or misuse of any UH document, record, or form of identification.

Financial Aid Statement

As you enroll in classes, it is very important to remember that colleges are required to take steps necessary to ensure that students are academically engaged in order to justify the disbursement of federal Title IV student aid funds. If students do not begin attendance in an online course, or stop participating in a course, Title IV funds must be returned according to Federal Return of Title IV funds regulations (34 CFR 668.21(a)), which means you may have to return some financial aid that you have received. If at any time your plans change and you no longer plan to participate in the courses in which you enrolled, you must contact the financial aid office to minimize any possible negative financial impact.

For more information on financial assistance for your education, please contact your home campus financial aid office. Financial assistance may include grants, scholarships and other resources to help you pay for the cost of college. A financial aid adviser will be able to help you navigate this process to determine your eligibility for these funds.

UH Title IX

- The University of Hawai'i is committed to providing a learning, working and living environment that promotes personal integrity, civility, and mutual respect and is free of all forms of sex discrimination and gender-based violence, including sexual assault, sexual harassment, gender-based harassment, domestic violence, dating violence, and stalking (UH Title IX). If you or someone you know is experiencing any of these, the University has staff and resources on your campus to support and assist you.
- If you would like to report incidents of sex discrimination or gender based violence, contact your campus Title IX Coordinator or submit the online reporting form.
- If you wish to remain ANONYMOUS, speak with someone CONFIDENTIALLY, or would like to receive information and support in a CONFIDENTIAL setting, contact your campus' confidential resource.

Accommodation Statement

The University of Hawai'i is committed to a barrier-free campus and provides

accommodations to ensure students with disabilities equal access to education. We agree to make academic adjustments to ensure non-discrimination of students with disabilities. This commitment is in accordance with applicable state and federal laws, including the Americans with Disabilities Act, and Sections 504 and 508 of the Rehabilitation Act.

Under the Americans with Disabilities Act (Title II) and the Rehabilitation act of 1973- section 504 and 508, individuals with disabilities have protections against discrimination and are assured access to programs, services and activities. For more information see “Americans with Disabilities Act” and “Rehabilitation Act of 1973 – Section 504 or Section 508”.

Students must self-identify to the appropriate Disability Services Office and complete the intake process before receiving reasonable accommodations. To ensure the prompt and effective provision of accommodations, students should contact the Disability Services Office as early as possible. Find your disability services office contact for your home campus.

UH Mānoa

Visit the KOKUA website. KOKUA can be reached at (808) 956-7511 or (808) 956-7612,

Additional Accommodations

Note that if you need any other accommodations that are not specified in these policies, please let me know by email. I cannot guarantee that I will be able to accommodate you, but I would at least like the opportunity to try. This is by no means an invitation to ask to do less work simply because you want to do less work, but is intended to recognize that we live in a quickly changing world that the university bureaucracy is not always equipped to handle. I will not offer accommodations that violate university policy, so *any accommodations relating to specific categories already covered by the university should only be guided by the above guidelines and rules. In particular, if you have KOKUA accommodations, you must go through them and cannot ask me for any additional accommodations they did not first approve.*

In any communications to me requesting additional accommodations for issues not covered by the above policies, *please protect your privacy: you do not need to divulge any information you do not wish to divulge.* Particularly during the pandemic, continuing as normal is difficult. If you run into technical challenges, family care issues, ongoing illness, etc., please let me know that you are facing “a challenge” and need to request an alternative assignment. If you would like, I will schedule a Skype or zoom call with you to discuss what sort of alternative assignment might work with your needs and resources and follow up over email documenting whatever assignment we agree on.

email: kokua@hawaii.edu.