Physics 122 – Fundamentals of Physics II

Spring2020

Sections	Lecture Hours
301-302-303-304	TuTh 3:30pm - 4:45pm PHY 1410
502-503-SES1	Tu 7:00pm - 8:50pm Th 7:00pm - 7:50pm PHY 1410

Lecturer: **Dr. Heidarian**

Email: **nheidari@umd.edu**

Office: 3102 John S. Toll Physics Building

TEL: 301.405.6088

- Prerequisites: PHYS 121 or similar or comparable course, or permission of department. Students are expected to be comfortable and proficient in algebra and trigonometry.
- Office Hours: Tuesdays 2-3 pm, and Thursdays 5-6pm. Any other day/time only by appointment. If you have any questions regarding the course, please send me an email and make sure you include your course number and section number. Any question regarding the Lab should be directed to your Lab TA.
- Recommended Textbook: "College Physics: A Strategic Approach" by Knight, Jones and Field, published by Addison-Wesley / Pearson. This textbook is recommended for the course. You can also use other editions of the book or any other General Physics book you can find in the library.

- Homework grades are worth %20 of your total grade so make sure you submit your work on time. The deadlines will be announced on ELMS soon.
- It is your responsibility to check ELMS, and all announcements, due dates, exam dates carefully. Also, please don't forget that showing up in class is part of your commitment when you sign up for the course and your presence in class is expected. I will randomly check your presence in class and more than three unexcused abscesses will be reported to the university.
- Website: The class schedule and any class related activity (grades, assignments etc.) will be posted on ELMS. http://elms.umd.edu

Course Description:

PHYS 122 is the second of a two-semester series in general physics. The course is a continuation of PHYS 121, and covers waves, electricity and magnetism, optics, and modern physics. This survey course, together with PHYS 121, generally satisfies the minimum requirement of medical and dental schools. Below is an overview of the main topics we will discuss in class:

Oscillations and Waves • Oscillations • Traveling Waves and Sound • Superposition and Standing Waves **Electricity and Magnetism** • Charges and Forces • Electric potential • Current and Resistance • Circuits • Magnetic Fields and Forces • EM Induction and EM Waves • AC Electricity	**Optics** • Ray Optics • Wave Optics • Optical Instruments **Modern Physics** • Quantum Physics • Physics of Atoms

ESSENTIAL INFORMATION ABOUT THE COURSE

Lectures

- Students are required to attend lectures, where the course material will be presented. Selected practice problems will be discussed in class without prior announcement.
  - If you miss a class, make sure you get the notes from others.
  - Please note that we cover many topics during the semester, therefore, there is not enough time to work on many example problems in class. Make sure you solve as many problems as possible and ask your TA for help. Problem solving is the only way you can learn these concepts. Always show up in your discussion classes with your questions!
- Note that NOT all material will be directly covered in lectures. The combination of all activities during Lecture hours, Labs, and discussion sessions will help you learn the concepts. Remember, you can Not learn physics by reading the textbook only. Physics is Problem Solving! You will learn the concepts through practicing and working on problems. I will upload practice problems on ELMS with a key. The complete solution to practice problems will Not be provided. Working in groups and making sure you can solve as many practice problems as possible is highly recommended.

Labs

- Laboratory work will be carried out with the assistance of the Expert TA software, whose website is (https://theexpertta.com/). This website is how you will access your lab manual and additional assignments. You can purchase access directly from the Expert Ta web site instead of through the bookstore for an additional fee. The table below displays the class codes that you will use to purchase access to your section of the lab. In order to purchase your code, you should visit

  https://login.theexpertta.com/registration/classregistration.aspx

  at which point you will be prompted to enter a class code. When you enter your class code, you will be prompted to register and pay. **(Enter the code manually if you encounter any errors).**

Section	Class Registration URL
301	http://goeta.link/USH22MD-0761BE-1Y0
302	http://goeta.link/USH22MD-436FFF-1XZ
303	http://goeta.link/USH22MD-2CDB9F-1XY
304	http://goeta.link/USH22MD-45D966-1XX
502	http://goeta.link/USH22MD-E87591-1XW

503	http://goeta.link/USH22MD-5F8B2F-1XV
SES1	http://goeta.link/USH22MD-C3E814-1XU

- Students are required to complete a total of **10** laboratory assignments.
- Each week you will do the designated laboratory exercise, coordinated by your Teaching Assistant, and complete the assigned experiment.
- You should read the lab description beforehand. **For each lab, you must submit to ELMS complete lab report and answers to the questions before the due date.**
- Your lab grade will be based on these questions. The TA will deduct points if your handwriting is illegible, or if your answer is hard to understand.
- If you cannot attend a session for an excusable reason, you may attend another section given the same week **with the permission of the Instructor**. Or you may attend a scheduled makeup session. In general, it will only be possible to perform a single experiment during the makeup session.
- **Lab reports** are due one week after the day the experiment is done.
- Submission of lab reports is through ELMS.
- **Late lab reports will not be accepted unless there is a valid excuse and it is communicated beforehand.**
- The format expected for the lab reports is the one given in the TOC and Introduction part of the lab manual.
- **Please check the guidelines and ask your TA as how to prepare your lab report to avoid missing points.**
- Pre-lab questions are also going to have the same due date as the lab reports.
- Students only need to answer the questions on the ExpertTA website.
- Pre-lab questions for each experiment will have **4 points** out of the total 20 points of that experiment.
- Students are not required to submit pre-lab questions for the first 2 experiments.

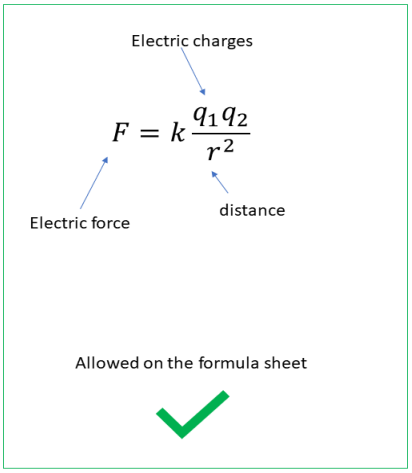
Discussions

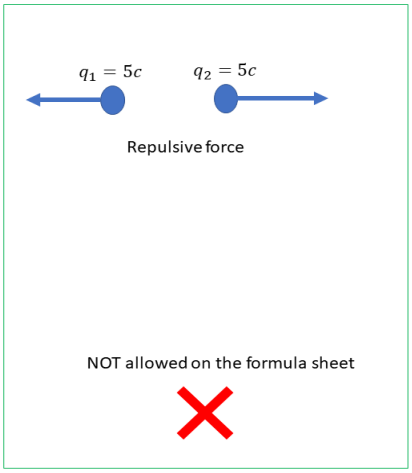
- Discussion sessions are a great place to clear any confusions about the material and ask questions about the homework problems.
- Your presence makes all the difference. Please show up and ask questions! This is your chance to make sure you understand the concept and that you can solve a problem with the formula you have learned in the lecture!
- **You will have a quiz during your discussion class (%10 of total grade).**
- These discussions sessions will be conducted by Teaching Assistants, where problems will be worked with student participation.
- It is TAs responsibility to know what has been taught in the class.

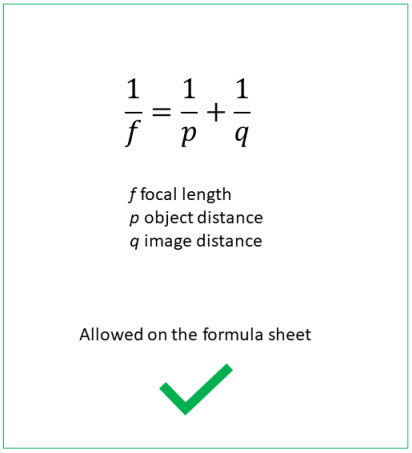
Homework

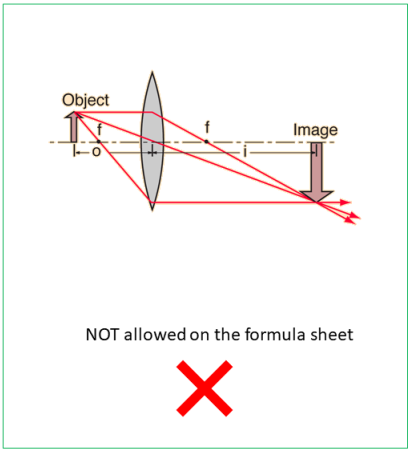
- Homework will be carried out with the assistance of the **Expert TA** software. Please notice that Expert TA for Homework is separate from Expert TA for labs and you need to purchase both in order to complete your HW and your lab work.

	• Turning in late homework is not allowed under any circumstances. • It is your responsibility to check MasteringPhysics frequently to make sure you do not miss any due date.
Quiz	• During the discussion session**,** every week you will be given an open book, open notes quiz based on the topics discussed in class. • The TA will decide whether they want to take the quiz in the beginning or at the end of the discussion session. • **TAs** will write the quiz problem on the board. • During midterm/exam weeks, there will be no quiz.
Exams	• There will be **three** mid-term exams and **one** final exam. All exams are closed book. • Midterm exams are 55 minutes long. There will be no lecture after the exam. • You will need a regular calculator with standard trigonometry functions. • The exam sheets will contain any numerical constants that you will need. • You can bring **ONE** 8x11in paper formula sheet (No Problem Solutions allowed!). • For midterms only **one side** of the sheet is allowed • For the final exam you can use **both sides** of the sheet. • You are **required** to bring a formula sheet and turn it with your exam paper! Make a copy of your formula sheet for your record as it may not be returned to you. • **Write your name and section on your formula sheets**. • Formula sheet should not have any examples, drawings, interpretation or explanation. These will be considered as cheating. • You can label the parameters. • Exams must be taken on the scheduled dates. Unless it is discussed otherwise. • There will be **NO make-up for Midterms.** • The lowest of three scores in the midterm exams will be dropped so if you miss a midterm, that will automatically be your lowest midterm. • There will be an extra credit question on each exam. • For the final exam, make-up exams will be given only under extraordinary circumstances if arrangements are made with the instructor ahead of time. • E**xams will cover the material discussed in the class, lecture notes, problems solved in class, HW problems, and problems done during the discussion sessions.** • A problem set will be uploaded before each exam for practice. • **The following is an example of what is and is not allowed on the formula sheet.**









Course Grade break-down

- **The final grade will be based on the components below.**

Homework	**% 20**
Quiz	**% 10**
Lab	**% 20**
Mid-term exams	**% 30 (%15 each)**
Final exam	**% 20**

- **Best two out of three midterms will be used for the final grade.**

- **There will be no makeup exams.**
- Each midterm and the final exam will have multiple choice and comprehensive questions.

- You can have one formula sheet that you will attach to the exam at the end.
- You can have a calculator (**you cannot use anybody else's calculator. Please be prepared and check your calculators before the exam**). You will get most credits even if you don't calculate the final number as long as:
- you reduce the numbers to a simplified ratio and all the powers are reduced to single power.
- You simplify the units to correct and general units used for the final quantity of interest.
- The final grade will be set at the end of the semester after all work is completed.
- The final grade will be determined by the University of Maryland grading policy, quoted below:
- A excellent mastery of the subject and outstanding scholarship.
- B good mastery of the subject and good scholarship.
- C acceptable mastery of the subject and the usual achievement expected.
- D borderline understanding of the subject. It denotes marginal performance, and it does not represent satisfactory progress toward a degree.

Grading Scheme

A+ 100 % to 98.0%
A < 98.0 to 95.0%
A- < 95.0 to 90.0%
B+ < 90.0 to 88.0%
B < 88.0 to 85.0%
B- < 85.0 % to 80.0%
C+ < 80.0 % to 78.0%
C <78.0 % to 75.0%
C- < 75.0 % 70.0%
D+ <70.0 % to 68.0%

Please note, there will be no extra points/activity available beyond the extra credits on each exam, so plan ahead and if you are struggling, reach out before it's too late. The last day of classes is NOT a good time to reach out and ask for help!

Tutoring and Help

- You have access to various resources including my office hours, your TAs for the course, discussion sessions, and Tutoring in the department.
- Your instructor and TA have office hours, both scheduled and by appointment, and are happy to help you outside of class.

	• We are here to help you learn, so please don't hesitate to reach out and make sure you understand the course material before it's too late. • The Physics Department has a free tutoring service, at The Slawsky Clinic, which is located in Room 1214 in the Physics building. • You can get help at any time they are open, from 10 am until 3 pm, M-F. More information can be found at: http://umdphysics.umd.edu/academics/tutoring-a-academic-support/93-slawskyclinic.html
Course Evaluation	• Your participation in the evaluation of courses through CourseEvalUM is a responsibility you hold as a student member of our academic community. • Your feedback is confidential and important to the improvement of teaching and learning at the University. • You can go to the CourseEvalUM website (https://courseevalum.umd.edu/) to evaluate the course.
Weather and emergency closures	• In the event of a University Closure the department will do its best to accommodate students by scheduling make-up sessions.
Students with disabilities	Students with disabilities should meet with the instructor at the beginning of the semester so that appropriate arrangements can be made to accommodate the student's needs. Accommodations will be provided to enable students with documented disabilities to participate fully in the course. Students who are registered with DSS, and who are planning to take examinations at DSS facilities, are required to let me have the pertinent authorization forms in editable electronic format at least one week prior to each exam date.
Academic Integrity	• You must work by **yourself** on exams. • You must work on the homework by **yourself**. • Discussions with other students are strongly encouraged. But you should **not** just directly copy from anyone. Doing so is not only dishonest but will hurt your ability to do the problems on the exams.

Course Related Policies

Know Your Rights

Know the University of Maryland Policies for Undergraduate Students

For more information please visit this webpage:

http://www.ugst.umd.edu/courserelatedpolicies.html

Discussion and lab schedules:

Check Testudo

Section	Teaching Assistant	Time and Place	email
Discussion 301	Rajagopalan, Rohan	Th 900-950 Check Testudo	rrajagop@umd.edu
Lab 301	Rajagopalan, Rohan	Th 1000-1150 Check Testudo	
Discussion 302	Ekhterachian, Majid	Th 1200-1350 Check Testudo	ekhtera@umd.edu
Lab 302	Ekhterachian, Majid	Check Testudo	
Discussion 303	Yamaguchi, Evan	M 1300-1350 Check Testudo	eyamaguc@umd.edu
Lab 303	Dr. Heidarian	Check Testudo	nheidari@umd.edu
Discussion 304	Grant, Jacob	W 1300-1350 Check Testudo	jgrant16@umd.edu
Lab 304	Grant, Jacob	W 1400-1550 Check Testudo	
Discussion 502	Kumar, Kavic	Tu 1600-1650 Check Testudo	krk18@umd.edu
Lab 502	Kumar, Kavic	Tu 1700-1850 Check Testudo	
Discussion 503	Ramirez Ortiz, Jorge	M 1800-1850 Check Testudo	jorger99@terpmail.umd.edu
Lab 503	Ramirez Ortiz, Jorge	M 1900-2050 Check Testudo	
Discussion SEF1	Kumar, Kavic	Tu 2100-2150 Check Testudo	krk18@umd.edu
Lab SEF1	Kumar, Kavic	Th 2000-2150 Check Testudo	

Lecture/Exam/Homework Schedule

- **The content of the mid-term exams may change depending on how the course develops and based on the need of the students**

Week Beginning (Monday)	Chapters covered during the week
Jan 27	Chapter 14 Oscillations
Feb 3	Chapters 15 Traveling Waves and Sound
Feb 10	Chapters 16 Superposition and Standing Waves
Feb 17	Chapter 20 Electric Fields and Forces
Midterm 1, Thursday Feb 20th	**Chapters 14-15-16-part of 20**
Feb 24	Chapter 20 Electric Fields and Forces
March 2	Chapter 21 Electric Potential
March 9	Chapter 22 Current and Resistance
SPRING BREAK- No Classes	**March 15th-22nd (Sunday-Sunday)**
March 23	Chapter 23 Circuits
March 30	Chapter 24 Magnetic Fields and Forces
Midterm 2, Thursday April 2nd	**Chapters 20-21-22-23-part of 24**
April 6	Chapter 24 Magnetic Fields and Forces
April 13	Chapter 25 EM Induction and EM Waves – chapter 17
April 20	Chapter 17 Wave Optics -chapter 18
April 27	Chapter 18 Ray Optics, Chapter 19 Optical Instruments
Midterm 3, Thursday April 30th	**Chapters 24-25-17-18**
May 4	Chapter 19- Chapter 29 Atomic spectra
May 12-Last Day of Classes	**Review**
Final Exam – May 14-20 (Thursday-Wednesday)	TBA-Please check Testudo

Physics 122 Labs, Spring 2020

Monday - Thursday

Instructor: Dr.Heidarian (nheidari@umd.edu)

Week	Week of	Expt #	Experiment Name
1	Jan 27	- -	1st Week of Classes – No Labs
2	Feb 3	1	The Pendulum
3	Feb 10	2	Sound and the Oscilloscope
4	Feb 17	3	Standing Waves on a Vibrating String
5	Feb 24	4	Voltage and Equipotential Surfaces
6	Mar 2	5	Charge to Mass Ratio of an Electron
7	Mar 9	(1 – 5)	Make-Up Week (Expts 1-5 only)
8	Mar 16	- -	Spring Break– No Labs
9	Mar 23	6	Resistance and Ohm's Law
10	Mar 30	7	Diffraction and Interference of Light
11	Apr 6	8	Ray Optics
12	Apr 13	9	Polarization of Light
13	Apr 20	10	Atomic Spectroscopy
14	Apr 27	(6 - 10)	Make-Up Week (Expts 6-10 only)
15	May 4	- -	No Labs This Week,

			unless there was an unexpected University closure
16	**May 11**	**- -**	**No Labs This Week**
16	**May 12**	**- -**	**Last Day of Classes**
16	**May 13**	**- -**	**Reading Day**
16, 17	**May 14-20**	**- -**	**Final Exams**
17	**May 21**	**- -**	**Main Commencement Ceremony**