

Physics 122 – Fundamentals of Physics II

Fall 2018

Sections: **0101 - 0102 - 0105**

Lecture Hours: **MWF 1:00pm-1:50pm, Room PHY 1410**

Lecturer: **Dr. Aria N. Heidarian**

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- **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:** By Appointment. If you have any questions regarding the logistics of the course please send me an email and if you have a physics question, I prefer to talk to you in person, so please make an appointment (via email) or stop by on MWF.
- **Textbook:** “College Physics: A Strategic Approach” by Knight, Jones and Field, published by Addison-Wesley / Pearson. You will also need to purchase an access code for MasteringPhysics which we will be using for homework assignments. The code can be acquired either from the bookstore, along with the textbook, or directly from the publisher.
- **Website:** The class schedule and every 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:

<p>Oscillations and Waves</p> <ul style="list-style-type: none"> • Oscillations • Traveling Waves and Sound • Superposition and Standing Waves <p>Electricity and Magnetism</p> <ul style="list-style-type: none"> • Charges and Forces • Electric potential • Current and Resistance • Circuits • Magnetic Fields and Forces • EM Induction and EM Waves • AC Electricity 	<p>Optics</p> <ul style="list-style-type: none"> • Ray Optics • Wave Optics • Optical Instruments <p>Modern Physics</p> <ul style="list-style-type: none"> • Quantum Physics • Physics of Atoms
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A few things to pay close attention to:

Lectures	<ul style="list-style-type: none"> • Students are required to attend lectures, where the course material will be presented, and homework assignments and exams will be announced, given, and collected. ○ At least one question in the exams will be from the examples done in class. • Note that NOT all material will be directly covered in lectures. The combination of activities during Lecture hours, Labs, and discussion sessions will help you learn the concepts. Remember, you can Not learn physics by just reading the textbook. Physics is Problem Solving! You will only learn the concept through practicing and working on problems.
Labs	<ul style="list-style-type: none"> • 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.

Section	**Class Registration Code
101	http://goeta.link/USH22MD-9E25DE-1PS
102	http://goeta.link/USH22MD-FE24BD-1PR
105	http://goeta.link/USH22MD-9871F4-1PQ
Section	**Class Registration Code
401	http://goeta.link/USH22MD-3F1588-1PV
402	http://goeta.link/USH22MD-18E317-1PU
SEF1	http://goeta.link/USH22MD-34B47D-1PT

- 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.
- The format expected for the lab reports is the one given in the TOC and Introduction part of the lab manual.
- **Pre-lab** questions are also going to have the same due date as the lab reports.
- students only need to answer the questions on TheExpertTA website.
- Pre-lab questions for each experiment will have **2 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.

	<ul style="list-style-type: none"> • Your presence makes all the difference. Please show up (The TAs will take attendance!) and ask questions! This is your chance to make sure you understand the concept and can actually solve a problem with the formula you have learned in the class! • These discussions sessions will be conducted by Teaching Assistants and where problems will be worked with student participation. • It is TAs responsibility to know what has been taught in the class.
<h2>Homework</h2>	<ul style="list-style-type: none"> • Homework problems from the textbook will be assigned throughout the term. The assignments will be in electronic format and will be carried out using the MasteringPhysics software. • 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.
<h2>HW Quiz</h2>	<ul style="list-style-type: none"> • During the discussion sections, every week you will be given an open book quiz based on the assignment due that week. • A one-problem quiz is taken during the first session after the due date of each HW set. The quiz problem will be a problem very similar to one of the problems in the corresponding HW set. • 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. • Students are not allowed formula sheets but they can ask which formula they want and TA will provide it to the student.
<h2>Exams</h2>	<ul style="list-style-type: none"> • There will be three mid-term exams and one final exam. All exams are closed book. • 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 turn your formula sheet with your exam paper! Make a copy of your formula sheet for your record as it may not be returned to you. • Exams must be taken on the scheduled dates. • 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 in 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.
- **Exams will cover the material discussed in the class, lecture notes, problems solved in class, HW problems, and problems done during the discussion sessions.**

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

Homework	% 20
Quiz	% 10
Lab	% 20
3 Mid-term exams	% 30 (%15 each)
Final exam	% 20
Class Participation	% 15
+ Course Evaluation (Extra Credit)	

- Best two out of three midterms will be used for the final grade.
- **There will be no makeups.**

Exam prep

- For the midterms and the final exam just make sure that you understand all the problems we do in class, in the homework, and during the discussion sections. If you understand these problems and know (not memorize) how to solve them, you will have no problem with the exam.
- Each midterm will be 6 problems, worth 125 points (25 points is extra credit).
- you can have one formula sheet that you will attach to the exam at the end.
- You can have a calculator, but you will get most credits even if you don't calculate the final number as long as:

Course Grade break-down

- 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 %	to	70.0%
D+	<70.0 %	to	68.0%

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.

	<ul style="list-style-type: none"> • 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.
<p>Weather and emergency closures</p>	<ul style="list-style-type: none"> • In the event of a University Closure the department will do its best to accommodate students by scheduling make-up sessions.
<p>Students with disabilities</p>	<p>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.</p>
<p>Academic Integrity</p>	<ul style="list-style-type: none"> • 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.
<p>Course Related Policies</p>	<p style="text-align: center;">Know Your Rights Know the University of Maryland Policies for Undergraduate Students</p> <p style="text-align: center;">For more information please visit this webpage: http://www.ugst.umd.edu/courserelatedpolicies.html</p>

Discussion and lab schedules:

Check Testudo to confirm

Section	Teaching Assistant	Time and Place	email
Discussion 101	Moy, Benjamin	M 1500-1550 EGR 2116	bmoy@umd.edu
Lab 101	Sridhar, Preethi	M 1600-1750 PHY 3314	psridha1@terpmail.umd.edu
Discussion 102	Moy, Benjamin	Tu 900-950 ATL 0201	bmoy@umd.edu
Lab 102	Sridhar, Preethi	Tu 1000-1150 PHY 3314	psridha1@terpmail.umd.edu
Discussion 105	Antonini, Stefano	Th 1600-1650 PHY 1204	santonin@terpmail.umd.edu
Lab 105	Kunjummen, Jonathan	Tu 1600-1750 PHY 3314	jkunjumm@umd.edu
Discussion 401	Antonini, Stefano	W 1930-2020 PHY 1204	santonin@terpmail.umd.edu
Lab 401	Sridhar, Preethi	M 1930-2120 PHY 3314	psridha1@terpmail.umd.edu
Discussion 402	Antonini, Stefano	M 1930-2020 PHY 1204	santonin@terpmail.umd.edu
Lab 402	Kunjummen, Jonathan	W 1930-2120 PHY 3314	jkunjumm@umd.edu
SEF1 Discussion		W 7:30pm-8:20pm PHY 1204	
SEF1 Lab		M 7:30pm - 9:20pm PHY 3314	

Lecture/Exam/Homework Schedule: Physics 1410,

MWF 1:00 pm – 1:50 pm

Prof. Aria N. Heidarian

Week Beginning	Chapters covered during the week
Aug 27	Chapter 14 Oscillations
Sep 3 Monday- No Class- Labor Day	Chapters 15 Traveling Waves and Sound
Sep 10	Chapters 16 Superposition and Standing Waves
Sep 17	Chapter 20 Electric Fields and Forces
Sep 24	Chapter 20- 21 Electric Potential
Friday Sep 28 st Midterm 1	Midterm 1 Chapters 14-15-16-20-21
Oct 1	Chapter 22 Current and Resistance
Oct 8	Chapter 23 Circuits
Oct 15	Chapter 24 Magnetic Fields and Forces
Oct 22	Chapter 25 EM Induction and EM Waves
Oct 29	Chapter 26 AC Electricity
Friday Nov 2 nd Midterm 2	Midterm 2, Chapters 22-23-24-25-26
Nov 5	Chapter 17 Wave Optics
Nov 12	Chapter 17-18 Ray Optics
Nov 19	Chapter 18-19 Optical Instruments
Thanksgiving No Class	November 21-25 (Wednesday-Sunday)
Nov 26	Chapter 19 Optical Instruments
Friday Nov 30 th Midterm 3	Midterm 3 Chapters 17-18-19
Dec 3	Chapter 29 Atoms and Molecules, Review
Monday Dec 10, Last Day of Classes	Review
Final Exam Dec 13 Thursday	1:30-3:30 pm Final Exam

Lab Schedule

Physics 122 Labs, Fall 2018

Mon, Tue, Wed, Thu

Instructor: Negar Heidarian Boroujeni

nheidari@umd.edu

Week	Week of	Expt #	Experiment Name
1	Aug 27	~	1st Week of Classes – No Labs
2	*Sep 3	~	2nd Week of Classes – No Labs
3	Sep 10	1	The Pendulum
4	Sep 17	7	The Digital Oscilloscope
5	Sep 24	3	Standing Waves on Vibrating String
6	Oct 1	4	Charge to Mass Ratio of Electron
7	Oct 8	5	Voltage and Equipotential Surfaces
8	Oct 15	1, 7, 3, 4, 5	Make-Up Week (Expts 1, 7, 3, 4, and 5 only)

9	Oct 22	6	Resistance and Ohm's Law
10	Oct 29	8	Magnetic Force between Currents
11	Nov 5	9	Induction and Faraday's Law
12	Nov 12	2	Ray Optics
13	Nov 19	~	Thanksgiving Week – No Labs
14	Nov 26	10	Diffraction and Interference of Light
15	Dec 3	6, 8, 9, 2, 10	Make-Up Week (Expts 6, 8, 9, 2 and 10 only)
16	Dec 10	--	Last Day of Classes
16	Dec 11	--	Reading Day
16, 17	Dec 12 - 18	--	Final Exams
17	Dec 18	--	Main Commencement Ceremony

*Sep 3 is Labor Day, a University Holiday