PHYS121
Fundamentals of Physics I
Summer 2023

Dr Matt Severson – mseverso@umd.edu – PHY3124C – Office Hrs T-Th 3-4pm

Lecture PHY 1201
MW 5:30 - 7:20pm
TTh 5:30 - 7:00pm
(no class Fridays, except for midterm and final exam)

Sec	Meeting Time	TA	Email	Office hours
0181	Lab TTh 7-8:50pm PHY3306 Dis MW 7:30-8:20pm PHY 1201			
0182	Lab MW 7:30-9:20pm PHY3306 Dis TTh 7-7:50pm PHY 1201			

NOTE: Details in this syllabus should be taken as tentative. I will notify you when changes are made.

Course Description

The 121-122 course sequence gives an introduction to the basic concepts of classical and modern physics intended for students studying biology, biochemistry, or other life sciences subjects, including pre-med track.

This first course in the sequence will begin with a brief introduction to measurement, units, and the scientific process before covering Newtonian mechanics, rotation, conservation laws, solids and fluids.

Required Prerequisite or Co-requisite: MATH112 or MATH115 (or equivalent/ AP test credit)

Recommended Textbook: *College Physics*, 4th ed. R. Knight, B. Jones, S. Field (Pearson, 2019). ***No Mastering Physics.***

The lab manual for the course exists only inside **the Expert TA** system (see below).

Discussion and Lab

You will have a 1-hr discussion and a 2-hr lab for your section twice each week (see schedule). In the lab sessions, you will perform experiments that further demonstrate select topics from the course material. The lab manual and the required pre-lab exercises are available only through Expert TA online (see more below).

It is administrative policy that you must complete every lab experiment and pass the lab portion of the course (independently) in order to pass the course as a whole. Make-up sessions will be available to deal with legit absences.

Please notify me ASAP, and preferably in advance, if you need to miss a lab.

Discussion sessions will consist of (usually) the short quizzes discussed below followed by about 45 minutes of time to work with the TA on any problem or difficulty you have come across in the homework assignments.

Assignments

Homework: I will assign homework roughly every week; the homework will be designed to develop your ability to set up and solve problems pertaining to the mathematical physical laws studied in each chapter; required exercises will be **completed in Expert TA** online (see more below). I will also assign a few recommended exercises from the book to be worked out on paper. Solutions for these will be provided after the fact.

A late assignment may incur a penalty, depending on the extent and circumstances. I will drop your lowest assignment score before computing your average.

Quizzes: You will have about 6 quizzes, which will take place in the first ~10 minutes of most discussion sections. Quizzes will be closed book, but all formulae will be provided for you. The quiz problems will be largely straightforward and are intended to check your competency in topics from recent homework assignments.

Makeup quizzes will be difficult or impossible to schedule given our summer pace. I will drop your lowest quiz score before computing your average, I will have VERY little sympathy in dealing with makeups beyond that.

Lab Reports: The results of each experiment will need to be compiled and addressed thoroughly in a lab report. The reports are due at the start of the next lab unless otherwise specified.

Reports are submitted as a pair by partners, and you should work with your lab partner to write them.

Details of how to write an adequate report can be found in the lab manual introduction.

Pre-lab Exercises: Pre-lab assignments are due ***before the start*** of each lab. They are **in the Expert TA lab system** and will be completed and submitted within that online system. The consist of a few questions pertaining to the theory or experiment details corresponding to each lab and should usually require only the Experiment Introduction from the lab manual as a resource. **THERE ARE NO PRE-LAB MAKEUPS without bona-fide and documented lab absence.**

Exams: You will also have 2 exams + 1 short pre-test, consisting of a couple short-answer questions about basic concepts and several homework-like problems to solve. Exams will be pseudo-cumulative but will not explicitly test on material covered in previous exams. **See Schedule for dates.**

Expert TA

You will need to purchase access to the homework AND the lab for the course in Expert TA in order to complete the required portion of the homework exercises through their online system. These are TWO SEPARATE POINTS OF ACCESS.

Registration for the homework will commence automatically when you start the first assignment in ELMS.

Registration for lab will be discussed via announcement shortly.

Payment can be made by credit card during the process, or a payment code can be purchased bundled with your textbook at the bookstore (or elsewhere) for a surcharge.

Grading Scheme

Lab	20%
Homework	20%
Quizzes	20%
Exams	40%
(2 @ ~16% each + Exam 0 @ 8%)	

ELMS Posts and Communicating with Me

I will clearly post all announcements, assignments, due dates, and other important information on the course ELMS page. I will also use ELMS to send course-wide emails when necessary. It is your responsibility to find such information on ELMS. Please check the page regularly for updates, or know how to find the info in email.

I will be rather inflexible in dealing with problems that arise due to your failure to know things that have been said on ELMS. That said, the TA or I will be happy to answer any other questions about course material, trouble with assignments, etc as they arise. Please feel free to send me email at any time for such reasons.

Attendance, Religious Observances, and University Closures

Your TA and I will be paying attention to who is here, who is participating, who comes to office hours, etc. Playing along in these ways will be quite beneficial to you, especially in the event of borderline performance in the course. For instance, if you wind up at the cutoff between two letter grades at the end of the semester, the effort you put forth throughout the course will be pivotal in my decision as to where to draw the line.

All that said, if you already know this material well, and you're only taking the course because your department is making you, I will not be offended by your regular absence in the classroom, and you will not be penalized for it, as long as you're present for exams, and quizzes, all of your assignments are turned in promptly, and your performance is satisfactory.

If you need to miss a lab, a deadline, or an exam for a religious observance or other legitimate reason, please notify me in advance, and preferably ASAP. If you miss a lab or exam due to illness or emergency, please get in touch ASAP after the fact. In all cases, a makeup exam will be arranged accordingly.

If the university is closed due to inclement weather or some emergency situation on or near an exam day or other important date, I will contact you on ELMS with further instructions.

Academic Integrity

Learning to solve problems in physics can be a difficult and tedious process; often students find it beneficial to work with a partner on such problems. This sort of behavior is encouraged, although you should avoid larger groups to discourage stragglers. That said, it is crucial that all students create and submit their own assignments. It will often be easy to tell your assignments apart, and so also easy to see if you have submitted someone else's work. Furthermore, I will be Googling the problems I assign so it will likely be clear to me if you've turned in work pulled straight from the internet. Such garbage behavior will not be tolerated and may result in an XF grade for the course and/or further action taken by the Student Honor Council.

Students with Disabilities

Accommodations will be provided to enable students with disabilities to participate fully in the course. Please discuss any needs with me at the beginning of the semester, so that appropriate arrangements can be made. Students who are registered with ADS and plan to take exams at their facilities should provide the pertinent authorization forms (electronic format is fine) at least one week prior to each exam date.

Tentative Lecture Schedule Outline

Wk	*Week of*	*Lecture Content (click for notes)*	*Chapters*	*Assignments*
1	May 29	***No class Monday - Memorial Day*** intro, dimensions & units, vectors, motion	1, 3.1	
2	Jun 5	kinematics, freefall, 2D motion, projectile motion, forces, Newton's 1st & 2nd laws, weight	2, 3, 4, 6.5	**HW1** - due 6/5 **Quiz 1 - in discussion T 6/6 and W 6/7**
3	Jun 12	3rd law, friction, *drag force*, circular motion	4, 5, 6.1-2	**HW2** - due 6/12 **Quiz 2 - in discussion M 6/12 and T 6/13** ***Exam 0 - Thu, Jun 15 -Ch 1-3***
4	Jun 19	***No class Monday - Juneteenth*** momentum & its conservation, kinetic energy, work, springs, power	9.1-6, 10	**HW3** - due 6/19 **Quiz 3 - T 6/20 and W 6/21** ***Exam 1 - Fri, Jun 23 - Ch 1-6***
5	Jun 26	potential energy, conservation of energy, rotational motion and kinematics, torque, center of mass, moment of inertia	10, 7, no rotate	**HW4** - due 6/26 **Quiz 4 - T 6/27 and W 6/28** **Quiz 5 - take home**
6	Jul 3	***No class Tuesday - 4th of July*** rotational KE, torque 2nd law, angular momentum	10.3 rot, 8.1, 9.7	**HW5** - due 7/3 **Quiz 6 - W 7/5 and Th 7/6** ***Exam 2 - Fri, Jul 7 - Ch 9, 10, 7, 8.1-2*** **HW6** - *not for credit (but content is on exam!)*

Physics 121 Labs, Summer 2023

Monday - Thursday, 7 – 9 pm

Instructor: Matt Severson

mseverso@umd.edu

Section 0181 *Meets Tuesday and Thursday*	Section 0182 *Meets Monday and Wednesday*

Summer Session I: May 30th – July 7th

Wk	Dates	Expt #	Experiment
1	May 30	--	No Labs
	May 31, Jun 1	1	Introduction to Data Analysis Using Excel
2	Jun 5, 6	2	Measurement and Uncertainty
	Jun 7, 8	3	Motion with Constant Velocity
3	Jun 12, 13	4	Motion with Constant Acceleration
	Jun 14, 15	5	Projectile Motion
4	Jun 19	--	No Labs – Juneteenth Holiday
	Jun 20, 21	6	Forces and Equilibrium
	Jun 22	7	Centripetal Acceleration
5	Jun 26	7	Centripetal Acceleration
	Jun 27, 28	8	Conservation of Linear Momentum
	Jun 29	9	Conservation of Energy
6	Jul 3	9	Conservation of Energy
	Jul 4	--	No Labs – Independence Day Holiday
	Jul 5, 6	1 - 9	Make Up Labs