

Physics 132 - Introduction to Physics II

What is light? What is an electron?

Spring 2022

Dr. <PROF_LAST_NAME>

How to contact me



Office Hasbrouck Lab Room 133



Email <PROF_EMAIL>

Rather than emailing questions to the teaching staff, I encourage you to post your questions on the Discord server ([see section below](#)) in order to get a more rapid response. Do feel free to contact me at this address, however, for appointments etc.

Class Sessions



Days Class meets Monday, Wednesdays and Fridays



Times Section 2: 9:05 – 9:55am

Section 1: 10:10 – 11:00 am



Location Hasbrouck 20



Lab

the section for which you are

Unlike P131, there are separate lab sections, please attend registered **Labs begin the second week of class**

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Welcome letter

I want to begin by recognizing both the challenges of the past two years and the ongoing challenges associated with the pandemic. Being here at all, moving your education forward, in the face of the lockdowns, isolation, and the sudden unique additional responsibilities that each of us have been, and in many cases still are, facing is a victory in of itself. You should be proud, and I would encourage you to take a second and reflect on that accomplishment. In this same vein, I want to be upfront and acknowledge that I know and understand that, particularly in the current situation, your academics may *not* be your first priority. You might be concerned for the physical, mental, and financial health of yourself or your family (however you define that term). You might have additional stress related to the issues of systemic inequities brought to the forefront of our national conversation, or due to the manifestations of the climate crisis. All of these concerns are legitimate, and it is perfectly reasonable for them to be higher priorities for you.

In light of all these challenges, my aim is to provide as much flexibility and support as possible to help you achieve whatever your goals may be for this course. If your goal is an “A,” I want to help you achieve that. If your objective is a “D,” that goal is equally valid in my eyes and I will work just as hard to help you achieve that goal.

In line with this aim, I want to point out, and encourage you to use the many supports available to help you achieve your goals. For help with the course specifically, there are several resources

available, detailed in the section [Where can I get help?](#) below and also listed on Moodle. There are also a range of resources on campus to help you. In particular, I would like to point out the [Center for Counseling and Psychological Health \(CCPH\)](#) which provides mental health services primarily by telephone, 413-545-2337, and is available 24 hours per day, 7 days per week, 365 days per year. There is also the [Writing Center](#), the [Learning Resource Center](#), and the [English as a Second Language \(ESL\) Program](#). These resources are there for you. Take advantage of them!

The University of Massachusetts Amherst is committed to making reasonable, effective and appropriate accommodations to meet the needs of students with disabilities and help create a barrier-free campus. If you need official accommodations, you have the right to have these met. I encourage you to visit the [Office of Disability Services](#) for help recognizing the supports available.

Personally, I hope is that you learn to appreciate the physics way of thinking. I know that physics may not be your favorite subject, and that you may even have some apprehensions about it. However, I feel that learning new ways of thinking and approaching problems is not only

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generally important, but also key to the development of new scientific ideas. In my opinion, the huge advancements in modern science at the intersections of disciplines support this position.

Not only does science benefit from the strengths of the different disciplines, but also from the strengths of different people and their backgrounds. If there are aspects of the course that prevent you from learning or make you feel excluded, please reach out to me. Together we'll develop strategies to meet both your needs and the requirements of the course. Moreover, regards to not only the course, but also accessing other services. I fully believe that UMass Amherst has your best interests at heart, but sometimes bureaucracy can be confusing or move a bit slowly. If you want help navigating the supports above, require someone to give the University a nudge, or even just need \$20 to eat, let me know and I will do what I can. Moreover, I recognize that each person learns differently. If your current habits are not yielding the results you want, please come and see me. I know quite a few techniques that I have used as well as techniques used by my colleagues in undergraduate and graduate school. We can work together to find study techniques that work for you.

I know this syllabus is longer than you are expecting. The length is not only to try and be as comprehensive as possible on the policies of the course, but also to explain my reasoning for those policies. The headings are designed to hopefully make it easier to navigate and find what you are looking for. To emphasize the most important points, there is a syllabus quiz on Moodle on which you must get at 100% before you will be able to access the homework. You have an unlimited number of tries, and are welcome (if not encouraged!) to have this document open while completing it.

Finally, as I said at the opening, I realize the pandemic has not yet abated. Please keep an eye on the [UMass-Amherst COVID-19 page](#) for the most up-to-date information regarding UMass

specifically and [the WHO](#) for general information. Moreover, while I firmly believe that the in-class has many benefits, I recognize that some people may be uncomfortable with the close-quarters of the Hasbrouck 20 lecture hall to which we have been assigned. I have added some flexibility in the course structure to accommodate as best I can.

I look forward to getting to know you and sharing a vision of the world I find beautiful and elegant. I encourage you to come by an office hour to talk about the class or just to chat. I love learning from my students, about other fields of science and folk's non-science interests.

<PROF_FULL_NAME>

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What tools will we use? What will we use them for? How much do they cost?



Moodle - Free I will use Moodle extensively for:

- Hub for all other tools
- Surveys
- Posting slides and other resources
- Extra credit opportunities.

Make sure you are accessing the new cloud-based moodle at

<https://umass.moonami.com/>



iClicker - Approx \$30.00 In this class, we will be using iClickers for the homework quizzes and for other questions in class. You can use either the physical clicker OR the [iClicker cloud app](#). will need to register your iClicker to this course using the iClicker block on Moodle



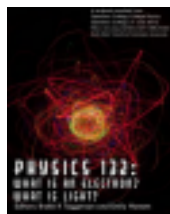
Edfinity Homework

System - \$23.25

We will use a different homework system in this course relative to mentioned below.

131. You will need to get an account on this system. Instructions will be available on Moodle.

However, the homework is also fully integrated into the textbook



Textbook - Free We have custom *free* textbook specifically designed for this course. The textbook is located at <http://openbooks.library.umass.edu/toggerson-132/> and has videos, simulations, as well as the homework integrated

throughout.



Discord - Free To provide support on homework and labs as well as a forum for asking questions during class, I have setup a discord server at <LINK_DISCORD> for this class. You can either signup with your personal Discord login or use the box on the Moodle page directly as a guest.

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Echo 360 - Free This will automatically record each day's lecture for viewing later, if you like.

Calculator You will need a calculator for: exams, quizzes, homework and in-class activities



Protractor or Ruler -

About \$2.00

will probably be useful throughout the course, you will need a ruler or protractor (probably better) for our unit on geometric optics.

Headphones - You probably have (if you don't see me!)

While a straight edge

Throughout the exams, there will occasionally be videos with additional instructions etc. You will want headphones for these so as not to disturb your peers.

Optional - Camera Many students find having a camera to be useful to take pictures of:

- Demos
 - Stuff of the board
 - Whiteboard work
- from a student suggestion last semester: many found having a collection of colored pencils or pens helpful for taking notes and exams.

Optional - Colored pencils or pens
This is an addition

Total required cost: between \$23.25 - \$58 • \$23.25 for Edfinity

- \$30.00 for an iClicker if you don't already have one
- \$2.00 for a protractor

What will I be learning?

The big question, “What is light? What is an electron?”

Almost everyone has a basic experience with light from everyday interactions, and in our modern world, electrons play a critical role in our everyday technology. Furthermore, most of you have talked about electrons and photons in other courses such as general chemistry. What really is light? What really is an electron? At their fundamental levels, what properties do these objects have? How do they interact with each other?

The goal of this course is to partially answer some these questions in a very modern way. To see a full list of what we are going to learn, look at the [What are we going to learn in this class?](#) document available on Moodle.

What other questions will we explore, and what is the schedule?

In addition to the big questions of “What is Light?

What is an Electron?” each of the course’s five units

(detailed below) will focus on exploring a specific

question from biology or chemistry. We want this course to be more than a “hurdle you have to take.”

We want to enrich and deepen your understanding of your other courses. The questions we will explore are detailed in the table on the next page.

This schedule is also available as a <LINK_CALENDAR>. The calendar is embedded in the Moodle page. You can also subscribe to the calendar on your own device.

Unit Number - Name (Conventional Name)	Central question from biology and chemistry that we will explore	Start Date / Homework due date
Unit I - What is the Fundamental Nature of Light and Electrons? (Quantum Mechanics)	Why does chemistry work? We know electrons in atoms exist in discrete energy levels, why?	First day of class Homework Due: 2 February
Exam I Covers Unit I 15 February See Moodle for Schedule		
Unit II - How do light and electrons move around and interact with matter? (Geometric Optics)	The human eye, how does it work? Why do different people have different glasses prescriptions?	force and energy we discussed in 131? 22 February Homework Due: 22 February
Unit III - How does having charge impact how electrons behave? (Electrostatics)	Gel electrophoresis and membrane potentials: both of these biological techniques center around the idea of “voltage.” What is “voltage?” How is it related to the ideas of	21 March Homework Due: 23 March
Exam II Cumulative through Unit III 7 April See Moodle for Schedule		
Unit IV - Getting electrons to move together and how can we use that? How do neurons work? (Circuits)	is waving in a light wave? The neuron: how can we model it as an electrical circuit? What can we learn about the biology by looking at a neuron from this perspective?	11 April Homework Due: 13 April 27 April
Unit V - Where does magnetism come from? What	How does this whole course fit together?	Homework Due: 27 April
Exam III Cumulative through Unit V TBD - During finals week		

- This is an algebra-based course so no familiarity with calculus is needed. However, I do

expect you to:

- Be comfortable with basic algebraic manipulations. Due to time, I will often breeze through some end-of-problem algebra. I expect you to be able to go back and fill these in.
- Be comfortable working and converting SI units. In particular, I expect you to *have memorized* the SI prefixes from nano- to giga-.
- Have a familiarity with trigonometry.
- Have familiarity with vector algebra (addition, and multiplication by a scalar).
- Be able to solve systems of equations.
- Have some basic geometric formulas such as the circumference of a circle

and the surface area of a sphere

- We will be building on the ideas from P131, in particular:
 - Forces and Newton's Laws.
 - Energy - both potential and kinetic.
 - Mathematical tools such as symbolic manipulation and vectors.
- I know that, while not technically a prerequisite, most all of you (>90%) have completed general chemistry (CHEM 111) and introductory biology (BIO 151). As life-science majors, I expect you to bring this material into the physics classroom: I will be making connections to these disciplines to help you connect to the material and to (hopefully) make it more interesting and applicable!

I will provide resources to review this material as needed.

Want to know more specifically what you will be learning (i.e. what will be on your exams)?

Go read [What we are going to learn in this class](#), which is also linked from moodle. That document describes exactly what you are going to learn over the course of each unit in full detail. *Those bullets are your exam questions!*

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What about lab?

Unlike Physics 131, this course has a laboratory component that meets separately from the other classroom sessions. *The point of the lab is to provide an opportunity to develop data analysis skills using real data, NOT to reinforce content from lecture.*

The laboratory section has set of skills and goals that are separate and distinct from class. As

such, the lab is run quasi-independently from the rest of the course including an additional syllabus and Moodle page for the lab.

You will learn a lot more about the goals, objectives, purpose, and structure of the lab through the lab Moodle and on your first day of lab. The key elements you need here are: • The lab does NOT meet the first week of class.

- The lab meets every week the remainder of the semester - one week in the experimental area collecting data and one week in a classroom focusing on data analysis.
- You will work in pairs during lab, but these groups will not be the same as your teams for class (too much of a logistical nightmare).
- There is a lab practical exam which you will complete on your own.
- Your lab grade will be folded in at the end of the semester. See the section on [How will my grade be computed?](#) below.

How will I be learning the material?

Overall philosophy - Learning is active

Lecture is an inherently passive process. In a lecture, we sit, we listen, and we take notes. However, [there are many scholarly articles](#) which clearly indicate that people's brains do NOT work this way – I cannot just put information in your heads via a lecture as in this *Calvin and Hobbes* comic.

Learning is actually intrinsically active: you need to spend time:

- using ideas to solve problems
- applying ideas to new situations
- connecting information to stuff you already know

If this is how people learn, then these are the activities we should do in class. Moreover, learning is *hard*. It is a *struggle*. It is *frustrating*. I want you to experience that frustration of struggle in an environment where you have support from your peers, myself, and our TAs.

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How do homework, class-time and exams relate to each other in this class?

What do I need to do before class? Readings and Homework.

If, in line with the philosophy above, we are to spend class time actually engaging with the material, then basic information needs to be delivered in another way. You will be responsible for completing a set of preparatory activities as homework to ensure that you are ready to begin exploring the finer points of the ideas and applying them in class.

- Preparation involves reading and completing some basic homework problems to help you ensure you fully understand what you need to in order to be able to participate in class.
- You are NOT expected to gain a complete mastery of all of the material – only a proficiency with the basic ideas.
- You are not only allowed, but encouraged, to get help on the homework from your peers, Discord, or any of the other resources listed on Moodle.
- In addition to ensuring you are ready for more complex ideas in class, preparatory homework also helps create a more equitable classroom experience: we will all be starting from the same place regardless of our prior preparation.

How should I approach the homework?

The homework is hosted in an online system called edfinity. You will be able to access the homework directly from Moodle as soon as you complete the quiz on this syllabus. There are two ways to make your life easy in doing the homework:

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1. Read the book and do the problems as you come to them	2. Connect each problem to the relevant content through the page at the end of the chapter. The problem numbers match those in Edfinity.
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Other homework FAQ

When is homework due?

Homework is due at *9am near the start of the unit*. See the calendar under [What will I be learning: What other questions will we explore, and what is the schedule?](#) for the exact dates of each assignment.

Is late homework accepted?

The purpose of the homework is to ensure that you are prepared for class. You are therefore encouraged to complete it by the due date at the beginning of the unit. However, I recognize that life happens; therefore, you may turn in the homework for *80% credit* until the next exam or until the next unit begins, which ever is first.

When can/should I start the homework?

All of the homework is accessible as soon as you complete the syllabus quiz. Given that the assignments are preparatory, you do not need to wait for us to finish Unit I before starting the Unit II homework (or even the Unit III!). The assignments are long, I encourage you to start early!

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Pro tip regarding the homework due after an exam: start early, and get as much done as you can. Then stop to study for the exam. After the exam, you will only then need to finish up!

How many attempts per problem do I get?

The homework is meant to help you learn the material. Therefore, you get 6 attempts per problem. **Don't wait until you are almost out of attempts to get help! Give a problem 2 or 3 serious tries and then get some help from me, a TA, or one of your colleagues!**

What can I expect to be doing during class?

Demonstrating your preparation through one-question quizzes

During *almost every* class there will be a one-question quiz on the part of your preparation relevant to the day's problems.

- The quiz *may or may not* necessarily be at the beginning of class, we will get to it when it fits the material.
- You *will be told in advance* the topic of the quiz question so you can go and review your prep if you wish. You will answer using your iClicker.
- You will answer twice: once individually and once either with your team (see more on teams below) or through discussion with your neighbors.
- Your final score will be a 50/50 split between your individual and team results.

What if I miss a quiz? Or what if I am absent?

A related quiz will be available online after class for you to complete:

- One question
- You will have 8 minutes to complete it.
- It will be open for one week.
- Obviously the single question will count for everything (no collaborative portion). These

online quizzes are purely for those folks who are not in class. If you do the in-class quiz, that is what will count for your grade. You are welcome to do these online quizzes for practice, but they will not count.

In recognition that life happens, the lowest three quiz grades will be dropped. These three drops are intended to cover most all events: religious observances, athletic events, illness, etc.

Please, therefore, manage them carefully. If an *extreme unforeseeable* event occurs, however, please do reach out and we can make some arrangement.

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What else will I be doing? Struggling to solve problems, NOT taking notes!

Class time will not be dominated by me doing a traditional “lecture.” Instead, as described in [How do homework, class time, and exams relate to each other in this class?](#), we will spend class time on various active learning activities. During class, you will be working with others to:

- Solve problems on whiteboards
 - Voting on multiple choice questions using clickers.
 - Drawing diagrams on whiteboards
 - Writing about physics ideas on scraps of paper
 - Predict the results of experiments

None of the activities in class, with the exception of the quiz are for a grade. They are designed to be an opportunity for you to learn and struggle without consequences. For example, you are

not penalized for getting an incorrect answer on non-quiz clicker questions. I do not even consider the responses on such questions for attendance; they are simply there to help you learn. I expect you to engage with them simply because they are the best way to check your understanding.

The word cloud at left is comprised of the various action verbs from the detailed [What are we going to learn in this class?](#) document.

Note that while we will be calculating, you will also be expected to discuss physics ideas in other representations such as diagrams and words as well. We will, in fact, be spending more time explaining concepts in words in this class than in P131. This increased verbal emphasis is a result of the fact that the concepts in P132 are much more abstract and removed from your everyday experience.

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If I am not taking notes during class how am I to study later?

I am not saying you will not take *any* notes, I am just saying you should spend class time working with ideas and thinking about the process instead of copying down any factual information. Some ideas of what to do include:

- Keeping a journal of “mistakes I made when solving problems, and how I can not make them again” (I think this is so important that I would require it if the class were smaller!) • Defining terms
- How you voted on in-class questions, your reasoning, and why your reasoning was right or wrong.

To allow you to focus on these more important activities during class, the class materials will be provided including:

- All slides will be posted immediately before class for those students who like to add notes to the slides or follow along

- Slides with full solutions and comments will be posted immediately after class
 - All lectures will be recorded and posted to Echo360 (linked from Moodle) for viewing later.
- While I firmly believe that in-class participation is the most effective, these Echo360 recordings can be used for those students who, due to COVID-19, are uncomfortable in Hasbrouck 20.

How will I show my mastery of the material?

Three exams

What is the point of the exams?

This is a question you may not have thought of before! However, I would encourage you to think about this question for every class you take.

My goals for the exams are:

- To check your grasp of the basics of the fundamental relationships in physics
- To see what you do NOT know so I can try to correct the gaps
- To see if you can APPLY the fundamental ideas we have learned *in-class* to explain NEW common phenomena. *The exams, therefore, will be problems you have not seen before.* I want you to be able to use the ideas and reason as a physicist – not just memorize solutions to problems you have seen.

Note the emphasis on *in-class*. Remember, homework gets you ready for quizzes which ensures you are ready for class which prepares you for exams.

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How many exams will there be and what will they cover?

There will be three exams in this course

- Exam I - February 15th: Covers Unit I
- Exam II - April 7th: Covers through Unit III
- Exam III - During Finals TBD: Covers all material

All exams are cumulative, but focus on the most recent material. Thus, Exam III will be essentially the same in form as the other two.

How will exams be structured?

I know that you will put a lot of effort into preparing for these exams and I want to maximize the learning from that effort. Therefore, each exam will have an individual portion (75% of the grade) and a collaborative portion (25%). The exams are hosted on Moodle as a Moodle quiz.

Individual portion (75% of total exam grade)

- Two different time slots available.

- Sign up on Moodle.
- Show up to your time slot.
- First come, first served.
- Bring your own device (we will have some spares, but not enough for everyone).
- ~10-15 computer graded questions (I write for time, not number of questions).
- The exam is NOT open-resource:
 - Moodle resources will lock automatically during the exam period.
 - Proctors will be walking around ensuring honesty.
- The exam should be do-able in about 1 hour with 4 minutes per multiple choice question (the MCAT gives you 2 minutes per question!)
 - **I am a strong believer in equitable design and think that, for this course, knowing the material is more important than knowing it fast - all students will therefore get double time: 2 hours to complete the exam**

Collaborative portion (25% of total exam grade)

- Required for all students.
- Same exam.
- Done during class the next day.
- Work either with your organized team (see below) or peers you can find.

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Exam materials

You will need to provide

- Your own computer. (we will have a few spares for emergencies, but not enough for everyone).
- A calculator.
- A pencil and protractor for the open-ended portion. You are welcome to bring pens etc. of different colors (sometimes useful!).

We will provide

- A desk with internet access.
- Proctors of whom you can ask questions.
- Paper for the long answer portion.
- In line with my goal that exams should not be about memorization, an equation sheet will be provided. You will have access to it in advance.

Not permitted

- Notes or other resources of any kind (physical or digital). All Moodle resources will lock at 4pm on the day of the exam and not re-open until after the collaborative portion the

- following day.
- Your own equation sheet.

How should I prepare for the exams?

There is a video on this on Moodle. Focus on what we did *in class*. If you find yourself memorizing a lot of formulae, or trying to memorize the solutions to “problems infinite sheets of charge” and “circuit problems” then you are probably going about it the wrong way. If you have questions, I encourage you to come to my office hours and we can discuss ways for you one-on-one. As with the quizzes, the ideas of the questions are already available as listed objectives for the course. For the exams, look in the [What are we going to learn in this class?](#) document on Moodle. The exams from past semesters are also available on Moodle for practice.

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Is this a team-based learning (TBL) class?

Ideally, yes, but...

Ideally, yes. However, the room to which we have been assigned by the University is not well suited to it. Moreover, I recognize that some people may not feel comfortable in the Hasbrouck 20 room due to COVID-19. As such, this is a *team optional class*:

- During the first week you can elect to be on a team or not.
- For those who express interest, I will then form teams of 4-5 students using the same CATME software with which some of you may already be familiar.

Why are you encouraging me to join a team if the room is not well suited to teamwork?

Research indicates that learning is, in addition to being inherently active, also an inherently social activity. We have all been in the rut where we can't figure something out, but as soon as we bounce ideas off someone else, we get it. That experience is a manifestation of the social aspect of learning: being forced to articulate your ideas clearly and bouncing ideas off of others improves learning and problem solving skills. In addition, the vast majority of you are interested in the science or health fields. In these fields, the lone-genius working by themselves, an archetype which is so prevalent in our culture, no longer exists (if they ever did)! To work in the science and health fields, you need to be able to work with others on scientifically challenging tasks. I am speaking from experience on this issue, the picture shows a *small fraction* of the 3000-person collaboration of which I was a part as a Ph.D. student.

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What benefits are there to being on a team?

1. You can be assured that everyone on your team will be present for almost every class (see the section on [responsibilities for being on a team](#) below). You therefore have the opportunity to develop a rapport with these students and learn the various strengths they bring to the team.
2. Since you can be assured that your teammates will be present for each class, you can be confident that you will have people to help you on in-class activities.
3. In this course, all [quizzes](#) and [exams](#) will have collaborative portions. If you are on a team, you will work on these with your team. From working together you will be well aware of each others' strengths and can expect a level of trust that people who are not in a team. *Last year, students who elected to be on teams had an team-exam average of 98.3% while those who elected to go solo had an team-exam average of 86.2%*

What additional responsibilities are there for being on a team?

1. When you sign up to be on an organized team, you are committing to being present in class for your team mates. As such, for folks who elect to be on organized teams, the

online quizzes can be used a **maximum of four** times. This means you can effectively miss seven class sessions without negatively impacting your grade: four online quizzes plus the three drops.

2. Your team will evaluate you on your contributions using the CATME system. The resulting multiplier will be applied to your team quizzes and exams.
 - a. For most people this multiplier is 1: i.e. the scores you earn on the collaborative exams and quizzes go into the gradebook as-is.
 - b. If one of your team-mates is not pulling their weight, they might end up with a multiplier less than one. For example, if the multiplier is 0.7 and your team earns a 95% on a collaborative exam, then that team-mate's grade will be $0.7 \times 95 = 66.5\%$
 - c. If your team mates agree that you are pulling *more than your fair share* you *might* earn a multiplier greater than 1, up to 1.05.
 - d. The peer evaluation is not zero-sum: someone does not need to get less than 1 for someone else to get greater than 1.
 - e. If all team members give each other perfect marks on the evaluation, then the result is that everyone pulled equal weight and everyone will earn a 1.

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Other team FAQ

Must I be on an organized team?

As listed above, you select to be on a team or not.

If I elect to be on an organized team and then change my mind later, can I leave?

Part of being on an organized team is committing to your teammates to help them out. Thus, leaving the team is not fair to the other members who are expecting you to be there. In *extreme* circumstances, however, please do reach out and we will talk about dropping you from a team.

Can I join a team later in the semester?

Unfortunately, this is not really possible logistically in a class this size.

Who makes the teams? Can I request to be with specific people?

Research clearly shows that teams made by the instructor perform better. I will therefore make the teams and thus cannot honor requests. However, if there is someone in the class with whom you *cannot* work for personal reasons, let me know and I *will* honor those.

If I do *not* elect to be on a team, can I still do the collaborative quizzes and exams?

Yes! In fact, you are expected to do them. You are just responsible for finding people to work with.

If I do not elect to be on a team, can I still work with people during class?

Of course! I want you to work with each other during class. Again, you will simply be responsible for arranging things yourself and there will not be any mechanisms in place to guarantee that your work partners are there.

Will the lab teams and the lecture teams be the same?

Unfortunately not. There are just too many variables to make that work.

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Regardless of if you choose to be on a team or not, you will NOT be sitting in class passively taking notes! You will be working on problems with your peers!

Where can I get help?

I want you to be successful in this class. As such, the following resources are available to

help you.

Survey the collection of on Moodle

resources

All of these resources, and perhaps others that become available, will be collected under a called “Where can I get help?” on Moodle. This will have the most up-to-date scheduling information.

section
section

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Ask your peers on Discord

I know many of you used Discord during the remote semesters. The Discord server is embedded within Moodle: you can either log in with your Discord account or just post from Moodle directly. You can ask essentially any question about anything and you can do it all anonymously.

Some example questions that I have seen asked in other classes include: • “I am stuck on homework problem X. Here is what I have tried, any ideas?” • “When is the next homework due?”

- “Where can I find such-and-such resource?”
 - “When is the consultation room open?”
 - “I read an article in the newspaper, and it seems to connect to what we are doing in class. Does it?”
 - “I didn’t quite follow slide X in today’s class. Can anyone help me out?”
- Basically, most of what you would ask a professor in an email can be asked on Discord, and I would encourage you to ask it there.** Not only will the TAs, as well as myself, be following Discord,

but so will the other people in this class. As a result, you are much more likely to get an answer more quickly.

What if I want to improve my study habits, have an administrative question, or am wondering about how what we are learning in class connects to other material? Help sessions in my office

During the first week of class, I will conduct a poll to determine what are the best times for me to hold help sessions in my office - Has 133. The resulting times will be posted on Moodle. Please do not hesitate to come by (no appointment needed) if:

- You want to know what are some better or more efficient ways to study for this class
- You have a suggestion for the course.
- Have an administrative question that is specific to you
- Wondering how the material we are learning connects to other things you have learned (these are not at all a waste of time; I really love these questions!)

While I will try to pick a time that works for the largest number of people, there is no way for me to pick a time that works for all 600 of my students. Thus, if my office hours do not work for you, then do not hesitate to reach out and we will arrange an appointment.

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What if I need homework help? The physics consultation room.

Hasbrouck 115 is the physics consultation room. This room will be staffed by a physics graduate student throughout the day. The exact hours will be on Moodle.

While any physics graduate student should be able to help you with your homework, the hours which will be staffed by P132 TAs will be also be noted.

How will my grade be computed?

If you have not read the section [How will I be learning the material?](#) please do so first as this section will not make much sense otherwise.

How much will each component be worth?

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Relative to P131:

- Lab is worth quite a bit **more** due to its additional importance (20% in P132 vs. 10% in P131)
- Quizzes are worth a bit **less** (10% in P132 vs. 20% in P131)
- Homework is worth **about the same** (12% in P132 vs. 10% in P131)

A spreadsheet will be available on Moodle to help you calculate your grade.

What will be the grading scale?

$A \geq 89\%$ $A- \geq 84\%$

$B+ \geq 81\%$ $B \geq 78\%$ $B- \geq 73\%$

$C+ \geq 69\%$ $C \geq 65\%$ $C- \geq 60\%$

$D+ \geq 55\%$ $D \geq 50\%$ $F < 50\%$

An 89% is guaranteed to be an A. A score of 88.9, however, is an A-. I reserve the right (but not the responsibility) to lower this scale if needed. Know, however, that I have never done this at UMass. A set scale like this, as opposed to a curve, is collaboration friendly. I am not looking for a certain number of A's. If everyone in the class earns above an 89%, then everyone will get

an A. **Therefore, working with your peers to help their understanding will NOT hurt your grade in any way!**

What do I need to do to earn an “A”?

The scale above is calculated assuming an A student will have the following averages:

Component An A-student should be able to average

Homework 100% Individual Exam Average **78%** Collaborative Exam Average 95% Individual Quiz Average **80%** Team Quiz Average 100% Lab Prep Homework Average 100% Lab Report Average 92.5% Lab Practical 90%

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You will notice that, in general, I do expect perfection from A-students on the preparation; In my mind, A-students will put in the diligent work to master the prep material before coming to class or lab. You will also notice, however, that I do NOT expect perfection of A-students on quizzes and exams. This material is hard. This type of thinking is new for you. Different people bring different skills. Some people just test poorly. Thus, I DON'T expect perfection on these components.

Will there be any extra credit available in this class?

A total of 3% of bonus on your final grade will be available throughout the semester for various assignments. No other bonus will be offered. These will typically be reflective assignments where you think about your progress, your study techniques, and how you might improve.

The number 3% has been carefully chosen. You can see looking at the grading scale above, that if you are close to the border of a threshold, 3% will bump you to the next level but will never bump you over a letter (you cannot go from B+ to A, only B+ to A-). Furthermore, in my view the grade you earned is the grade you have *before any bonus*. The bonus reflects an extra level of diligence and a willingness to not only engage in learning physics but in thinking about yourself as a learner as well. As such, no additional “bumps” will be given.

What if I have a question about how an assignment is graded?

While grading so many problems and exams mistakes do of course happen. However, as a rule the number of mistakes in your favor usually balances the number of mistakes against you. If you would like a regrade please bring the assignment to me WITHIN ONE WEEK of the date that the assignment is returned and I will regrade the ENTIRE assignment. It is possible that you can end up with a lower score. Requests for regades at the end of the semester will not be considered.

Academic Honesty

While I encourage you to work with your peers in this class, there are individual portions, in particular the individual quizzes and exams. We want our learning environment to be honest and fair. UMass Amherst has a [Academic Honesty Policy](#) that includes cheating and plagiarism as forms of dishonesty. I should not even have to say this, but cheating will not be tolerated on these individual activities. If you are caught cheating on an exam, the minimum consequence is that you will fail the class. Furthermore it is my responsibility to report you to the Dean of Students. Also, all students are expected to abide by the student policies at https://www.umass.edu/dean_students/campus-policies.

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