PHYS 122: Introductory Physics II — Spring 2023

Instructor: Dr. Cody Goolsby-Cole | Email: cagc@umbc.edu

Class: 11-11:50 AM in ITE 104 | Discussion: MTuW, based on registration

Welcome to Introductory Physics II! This course is the second semester of the calculus-based introductory physics courses and focuses on thermodynamics, electricity, DC circuits, and magnetism. The Table of Contents (formatted as a series of questions) below will help direct you to any section in the syllabus that you might be interested in, however it is your responsibility to read over the syllabus to familiarize yourself with course policies. Please let me know if you have any questions and I look forward to working with you this semester!

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What Are the Course Prerequisites?

Completion of MATH 152(H) with "C" or better OR concurrent enrollment in MATH 152(H); completion of PHYS 121(H) with "C" or better. Algebra, geometry, trigonometry, & calculus which will be used extensively throughout the course.

What are the Course Resources and Extra Help?

Office Hours: In-person hours in Physics Tutorial Center (Physics 226A); online hours on BB Collaborate.

Dr. G — M 12:10-1 PM; Tu (Online) 10-11 AM; W 2-3 PM; Th 1-2 PM

TA — Anoosha Fayyaz (afayyaz1@umbc.edu); In-person TBD; Online Tu 7-8 PM

TA — Liam Hunt (lhunt3@umbc.edu); In-person TBD; Online Th 7-8 PM

TA — Ismail Olumegbon (ismailo1@umbc.edu); In-person TBD; Online W 7-8 PM

Supplemental Instruction Peer-Assisted Study Sessions (SI PASS): SI PASS is a proactive academic assistance program that provides opportunities via group review sessions and collaborative learning, for students who want to learn course material more efficiently, improve their grades, and increase academic performance. Times and location: TBD.

Asynchronous Help — Discord Server: Discord allows for a continuous chat between students, TAs/LAs, and the instructor. Course announcements will also be posted on discord. Here is the link: https://discord.gg/yUbMwM8kUV. Enter your full name (as listed on the official class roster) and student ID in the approval chat to gain access to the rest of the course. Your nickname must also be the same as that listed on the official class roster.

Academic Success Center: The Academic Success Center provides centralized support services to all undergraduate students at UMBC — check it out today!

What Are the Required Materials and Technologies?

- **CMI**: This course participates in **Course Materials Initiative (CMI)** which is a program developed to provide students with reduced pricing for course materials through digital textbooks and ancillaries. The textbook (Tipler) and online resources (FlipIt Physics) are included when you register for this course and do not have to be purchased separately.
- **FlipIt Physics**: the primary course material used to deliver pre-lecture videos and homework assignments. Instructions on how to access are available on BB in the "Start Here!" section. The course access key is "8b2e6m2x9f" which is the same for everyone. You should receive an email from no-reply@verbasoftware.com that contains your individualized payment code. For questions contact FlipIt Physics: 1-800-936-6899 or FlipIt Physics Help.
- **Physics for Scientists and Engineers, by Tipler and Mosca, 6th ed., Volume 2**: An electronic version of this textbook is available online when you enroll in this course — see the Blackboard site for details. The textbook provides an additional perspective on the FlipIt material as well as worked out examples. For questions about how to obtain and access the online textbook contact the bookstore: textbook@umbc.edu or 410-455-2695.
- **Clickers**: You will be responding to in class questions using the PointSolutions app on your smartphone or computer. You do NOT have to have a physical clicker, instead you must have a clicker subscription which can be purchased from the UMBC bookstore or directly from PointSolutions. It will be your responsibility to remember to bring your computer/phone to respond to clicker questions. Hand written answers will not be accepted. For information on setting up your clicker see the clicker section on BB under the "Start Here!" tab.

- **Technology**: UMBC requires all students to be technologically self-sufficient, which entails having a **reliable personal computer** (preferably a laptop with webcam) and **Internet access**. Since UMBC requires all students to have a computer and Internet access, financial aid may be used to meet this requirement. To learn more, students should contact their financial aid counselor. In addition, the Division of Information Technology (DoIT) provides a wealth of resources and support, including tips for getting online and minimum specifications to consider when purchasing a computer.
- **Discord**: Discord allows for a continuous chat between students, TAs/LAs, and the instructor. Course announcements will also be posted on discord. Enter your full name (as listed on the class roster) and student ID in the approval chat to gain access to the rest of the course. Your nickname must also be the same as that listed on the official class roster.
- **Calculator**: you may use a scientific calculator on homework, discussions, and exams. No cell phones or any other mobile device will be permitted during exams.

How Will I be Graded?

Type of Assignment	Percentage
FlipIt Physics: Pre-lecture	2%
FlipIt Physics: Checkpoint	3%
In-class (Clicker) Questions	5%
Discussion	7.5%
FlipIt Homework	7.5%
Exams (6 @ 10% each)	60%
Final Exam	15%
Total	100%

Percent Range	Letter Grade
89.5% or Above	A
79.5% - 89.5%	B
69.5% - 79.5%	C
59.5% - 69.5%	D
59.5% or Below	F

There is **no** extra credit or additional assignments you can complete at the end of the semester to help boost your grade. If you are struggling in class, it is far easier to fix problems early in the semester than waiting until the end of the semester. Please come see me in office hours or send me an email to arrange a time to meet. You should check your grades regularly on BB, and contact me or your TA with any grading questions ASAP.

What are the Course Learning Objectives?

An integral component of this course are learning objectives (LOs) — a list of tasks that you should be able to perform by the end of the semester. The entire course (class time, discussion, homework, exams) is geared toward helping you develop the conceptual understanding and problem solving skills necessary to successfully complete these LOs.

The big, overarching LOs you should be able to demonstrate by the end of the semester are located on BB in the "Start Here!" section. Even more importantly are a detailed list of learning objectives that you should be able to perform for each FlipIt unit. You will find these on BB in each of the weekly folders and you should use them as a guide when studying for exams.

What Are the FlipIt Physics Pre-Lectures & Checkpoints?

You will be introduced to the material every week through FlipIt Units. Each FlipIt unit has associated videos and checkpoint questions that you must watch and answer before coming to class. Ideally you should do this the day before we have class to give your brain some time to absorb and process all the new content. The videos and checkpoint questions will be made available 5 days before they are due. Checkpoint questions can be graded either for participation, accuracy, or combination of both. Failure to watch the videos for their total length could result in losing credit for that unit.

It is important to put forth a solid effort on being introduced to and grappling with the material before coming to class. You should be actively watching the videos which means taking notes; pausing and rewinding; working out examples on your own; and writing down questions you have. Do not except to get much out of class; discussion; or homework if you don't put in the 30-60 minutes on the videos/checkpoint questions beforehand.

The FlipIt Physics pre-lectures and checkpoints will generally be due before class MWF at 10 AM. See the calendar on FlipIt for the exact schedule.

What Will I Be Doing During Class?

We will mainly be working through examples and problems from the most recent FlipIt units — not on introducing concepts and equations. Don't expect to get much out of class or discussion if you haven't put in a solid effort on watching the pre-lectures and working through the checkpoint questions before coming to class.

Clicker questions will be used to track attendance and promote active learning by providing instant feedback for both myself and for you. Clicker questions will mainly be graded on participation. I'll let you know if one is graded on accuracy.

I will post the class slides both blank and annotated on BB. Either print out a copy of the blank slides to bring to class or bring them up on your tablet and annotate them during class. Do not waste time coping down everything single thing on the slides as you can look over any notes I make afterwards when I post them on BB. Instead focus on trying your best to apply the concepts and equations from the FlipIt videos to the problems we work through during class.

If you miss any classes, you are still responsible for the material covered.

What Kind of Homework Will I Have?

The main way to learn physics is by doing physics, AKA working through homework problems. There will be a homework assignment associated with each of the FlipIt units which will usually be due on SuTuTh at 11:59 PM (see the exact schedule on the FlipIt Physics website for when each is due). They are made available 6 days before they are due.

You are allowed ten submissions per question and for numeral questions your answer must be to within 1% of the correct answer. Keep plenty of extra significant figures (at least four) for your

answers as answers to early parts of a problem are usually used later in the problem and rounding errors can cause you to miss a question even though your physics approach is correct. For most questions you will receive immediate feedback, however some questions with a clock symbol next to them have delayed feedback meaning you will not know whether you got it right or wrong until after the due date. Longer homework problems usually have a greater weight toward your overall homework grade than shorter problems. You will be able to see if you got the delayed feedback problems correct once the first due date has passed.

Before starting the homework, you should make sure you are able to solve and correctly think through the examples covered in the videos, class, and (if you've had it yet) discussion. When you get stuck on a homework problem refer back to FlipIt and class material to find similar examples and take advantage of office hours or the discord server.

I strongly discourage you from seeking out homework answers online. No doubt you can find answers if you look hard enough, but you are doing yourself a major disservice. Learning physics is a process that takes time, dedication, and hard work. Though finding answers online is attempting, you are short circuiting the learning process and having someone else do all the hard work for you.

You are encouraged to work together, however, it is your responsibility to fully understand the material. Even though homework constitutes 7.5% of your overall grade, exams — for which you are solely responsible — make up the majority at 75%. Don't expect to do well unless you have put in serious effort on the homework.

What is Discussion?

Discussions are weekly meetings (MTuW depending on which you registered for) where you work on a packet of problems in small groups. It's designed to provide you with a collaborative learning environment so you can help and learn from each other. You must attend the discussion section that you registered for. See your course schedule to find out which discussion section you are in and where it is located. The schedule for all discussions is list in the syllabus as well.

Each discussion grade will be based mainly on effort with part of your grade based on accuracy. The exact proportions are decided after each discussion with one or two pages of the discussion graded for accuracy. Attendance at the discussion is mandatory and full attendance is required. If you arrive more than 5 minutes late to discussion, you will lose 10% of your discussion grade with an additional 10% penalty for each 5 minute increment you are late.

You should bring your calculator, any notes you've taken, and the relevant equation sheet to discussion. You are not allowed to use any other electronics such as laptops or cellphones. Tablets are OK, but make sure they are flat on your table and not a distraction to others.

What Will the Exams Be Like?

If you want to do well in this course, then you will have to do well on the exams which constitutes 75% of your overall grade. The pre-lectures, checkpoint questions, classes, discussions, and

homework are meant to help you acquire the conceptual and problem-solving skills you'll need to do well on them.

Six 50-minute exams on Fridays from 11-11:50 AM. See the schedule at the end of the syllabus for the exact dates and exam content. You'll be assigned to a specific room and seat on campus to take the exam. There are no plans to use the 8 AM time slot on Mondays for exams as of now, but could be used if need be.

Each exam will consist of a mix of multiple-choice questions and free response questions. For the free response questions, you must show all work, calculations, and reasoning to receive full credit. Your work must start with the fundamental equations as listed on the equation sheets in variable form (these can be found on BB). The majority of points for free response questions can be earned based on your work and reasoning. Thus it is more important to understand the conceptual and problem-solving skills needed to arrive at the final answer than to know the final answer itself. Previous semesters exams will be made available for extra practice.

You are allowed to bring a scientific calculator during exams. No cell phones or other communication devices will be allowed.

Final Exam: The final exam will be comprehensive and take place on Friday May 19th from 10:30 AM - 12:30 PM (see the final exam schedule on the UMBC website).

What is the Make Up Policy?

Life is full of surprises so it's understandable that you might miss a class or two. The course policy has been set up to accommodate a few unexpected situations.

- Class: Three lowest clicker grades are dropped which count towards ALL absences and clicker malfunctions.
- FlipIt Physics Pre-lecture, Checkpoints and Homework: Earning 80% of possible points on FlipIt Prelectures/Checkpoints and FlipIt HW will get you full credit (Examples: You earn 84% of possible HW points? That becomes 100%. You earn 71% of possible HW points? That becomes (71/80)*100% = 89%.) In addition, you have two extra days to complete FlipIt assignments late (for example the late due date would be Tuesday 11:59 PM if the original is Sunday 11:59 PM). Completing assignments late gets you 80% of possible points; if your HW is always late and always perfect you'll end up with a 100% HW grade.
- Discussion: There is no make-up discussion. The lowest discussion score will be dropped at the end of the semester. If you must miss a discussion for legitimate reasons*, contact your TA as soon as possible to make a possible arrangement to attend another discussion section that week.
- Exams: Make-ups will only be allowed for legitimate reasons*, and it is your responsibility to contact me ASAP regarding arrangements for a possible make-up. Failure to do so could result in a zero for that exam.
- Final exam: There is NO make up for the final exam. An alternate time for the final exam might be allowed in cases where another class's final exam conflicts with our final exam (you will be required to provide documentation showing this). It is your responsibility to find out

when your final exams will occur and e-mail me well in advance of the week of finals if you discover a conflict with another class.

*Legitimate reasons are defined as officially-sanctioned UMBC activities, illness, family emergency, detention by authorities, or another insurmountable difficulty. I'll request written verification for the cause of your absence.

What is the Instructor's Email Policy?

E-mail is not a good way of addressing physics related questions and I will **not** answer such questions by e-mail. It's not that I don't want to help you out on questions related to the content (in fact it's one of the best parts of my job!), it's just that trying to answer physics questions through email is terribly inefficient. Much better avenues are during my office hours, on the Discord server, during discussion, with TAs during their office hours, at a SI/PASS session, with tutors at the Academic Success Center, or with fellow students.

Email is — however — a great way for non-physics questions such as questions about your grades. Please include your full name, course number, and use your UMBC email address to ensure a prompt response.

What is the Academic Integrity Policy?

All instances of academic misconduct will be addressed according to the UMBC Policy on Academic Integrity. Examples include attempting to make use of disallowed materials on assignments, attempting to communicate with anyone other than the instructor or TA during exams, soliciting help by posting material on the internet for any assignment, looking at posted material from others online, altering graded work and submitting it for regrading, asking someone else to take an assignment in your place, copying another's work on an assignment, asking someone else to do an assignment and representing it as your own, permitting or assisting another student to carry out any of the above, and any other instance of academic misconduct. Penalties range from a grade of 0 on the assignment to an F in the course (at my discretion), and from denotation of academic misconduct on the transcript to expulsion (as determined by official hearing of the Academic Conduct Committee).

What is the Student Disability Services (SDS) Policy?

Accommodations for students with disabilities are provided for all students with a qualified disability under the Americans with Disabilities Act (ADA & ADAAA) and Section 504 of the Rehabilitation Act who request and are eligible for accommodations. The Office of Student Disability Services (SDS) is the UMBC department designated to coordinate accommodations that would create equal access for students when barriers to participation exist in University courses, programs, or activities.

If you have a documented disability and need to request academic accommodations in your courses, please refer to the SDS website at sds.umbc.edu for registration information and office procedures (disAbility@umbc.edu and (410) 455-2459).

If you want to use your SDS approved accommodations in this class, please must contact me to discuss implementation of the accommodations. Your accommodations are not automatically applied. You must also register to take each exam at SDS at least two business days before the exam date. Failure to do so could result in not being allowed extra time accommodations on your exams.

What are Resources for Sexual Misconduct/Harassment & Gender Discrimination?

UMBC's Policy on Sexual Misconduct, Sexual Harassment and Gender Discrimination and Federal Title IX law prohibit discrimination and harassment on the basis of sex in University programs and activities. Any student who is impacted by sexual harassment, sexual assault, domestic violence, dating violence, stalking, sexual exploitation, gender discrimination, pregnancy discrimination, gender-based harassment or retaliation should contact the University's Title IX Coordinator to make a report and/or access support and resources:

Mikhel A. Kushner, Title IX Coordinator (she/her/hers)
410-455-1250 (direct line), kushner@umbc.edu

You can access support and resources even if you do not want to take any further action. You will not be forced to file a formal complaint or police report. Please be aware that the University may take action on its own if essential to protect the safety of the community.

If you are interested in or thinking about making a report, please see the Online Reporting Form. Please note that, while University options to respond may be limited, there is an anonymous reporting option via the online form and every effort will be made to address concerns reported anonymously.

Where is the Discussion Schedule & Discussion Instructor Information?

	Monday	Tuesday	Wednesday
8:00			**8:00-9:50 AM** S03 (4921) ILSB 101 Anoosha Fayyaz* *Noah Manasterli; Ben Trivas* S08 (6065) ILSB 201 Ismail Olumegbon* *Laylor Matsibo*
8:30			
9:00			
9:30			
…			
2:30		**2:30-4:20 PM** S04 (4922) ILSB 101 Ismail Olumegbon* *Emma Heijstee, Chris Kelley* S09 (6066) ILSB 230 Liam Hunt* *Nick Berry, Ben Trivas*	
3:00			
3:30			
4:00			
4:30	**4:30-6:20 PM** S02 (4920) ILSB 101 Liam Hunt* *Nick Berry; Julianna Grasso*	**4:30-6:20 PM** S05 (4923) ILSB 101 Anoosha Fayyaz* *Julianna Grasso, Chris Kelley*	
5:00			
5:30			
6:00			
6:30	**6:30-8:20 PM** S06 (5999) ILSB 101 Liam Hunt* *Emma Heijstee*	**6:30-8:20 PM** S11 (6148) ILSB 201 Ismail Olumegbon* *Noah Manasterli*	
7:00			
7:30			
8:00			
8:30			

Teaching Assistants* (TAs) are current physics graduate students in charge of each discussion. *Learning Assistants* (LAs) are current undergraduate students that previously took PHYS 122.

Discussion Instructor E-mail

Anoosha Fayyaz (afayyaz1@umbc.edu)
Liam Hunt (lhunt3@umbc.edu)
Ismail Olumegbon (ismailo1@umbc.edu)

Where is the Class, Discussion, and Exam Schedule?

Week (Dates)	FlipIt Unit Class Material	Textbook Chapter (Supplemental Material)	FlipIt Unit Discussion MTuW	FlipIt Units Friday 11 AM Exams
1 (Jan 30 - Feb 3)	1 & 2	17, 18, & 20	1	
2 (Feb 6-10)	3 & 4	18 & 19	2 & 3	
3 (Feb 13-17)	4 & 5	19 & 21	4	Exam 1: 1-4
4 (Feb 20-24)	6-8	21 & 22	5 & 6	
5 (Feb 27-March 3)	8	22	7 & 8	Exam 2: 5-8
6 (March 6-10)	9 & 10	23	9	
7 (March 13-17)	11	24	10 & 11	Exam 3: 9-11
Spring Break!				
8 (Mar 27-31)	12, 13, & 14	24 & 25	12	
9 (Apr 3-7)	15	25	13, 14, & 15	Exam 4: 12-15
10 (Apr 10-14)	16, 17, & 18	26 & 27	16	
11 (Apr 17-21)	19	27	17, 18, & 19	Exam 5: 16-19
12 (Apr 24-28)	20 & 21	28	20	
13 (May 1-5)	21 & 22	28	21	
14 (May 8-12)	23	29	22 & 23	Exam 6: 20-23
16 (May 15-19)	Review			
Final Exam: Friday May 19th from 10:30 AM - 12:30 PM				

This is the schedule as of the beginning of the semester which is tentative and may be adjusted throughout the semester as needed by the instructor. See the schedule on FlipIt calendar for the most update schedule and announcements on BB for changes to the schedule.