

PHYS 121H: Introductory Physics I — Fall 2023

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Class: MWF 2-2:50 PM in SOND 107 | Discussion: Tu 1-2:50 PM in ILSB 237

Welcome to Introductory Physics I! This course is the first semester of the calculus-based introductory physics courses and will focus primarily on classical mechanics with topics including particle kinematics and dynamics, Newton's laws of motion and gravitation, rotational motion and dynamics, collisions, momentum, energy and conservation laws. The Table of Contents 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 151(H) with "C" or better OR concurrent enrollment in MATH 151(H). Algebra, geometry, trigonometry, & calculus will be used extensively throughout the course.

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 online resource (Achieve) is included when you register for this course and does not have to be purchased separately.
- **Achieve:** this is where you'll find the textbook, pre-lecture videos, and online homework assignments. Link to access Achieve is available on BB in the "Start Here!" section. Access to Achieve is included in CMI so no need to purchase this separately.
- **University Physics:** An electronic version of this textbook is available online through Achieve.
- **Poll Everywhere:** You will be responding to in class questions using the Poll Everywhere app on your smartphone or computer. It will be your responsibility to remember to bring your computer/phone to respond questions each day. Hand written answers will not be accepted. More info is 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, TA, and 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 non-graphing scientific calculator during quizzes and exams. The calculator should be able to perform basic arithmetic, trig functions, exponential, roots, and logarithms. No cell phones or any other mobile device will be permitted during quizzes or exams.

What are the Course Resources and Extra Help?

Physics Tutorial Center: located in the Physics Building room 226A. Open 12-5 PM MTuWTh on a walk-in basis for any student in the intro physics courses. Times for Dr. G and TA listed below; online office hour for Dr. G on Webex.

Dr. G — MW 3:10-4 PM; Th 2-3 PM; Tu 10-11 AM ([Webex](#) | password: umbc_physics); also feel free to stop by my office (Physics 323) anytime. If I'm there and have the time, I'll be happy to answer any questions.

TA — Sandra Cheng (scheng5@umbc.edu); Th 1-2 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

Discord Server: Discord allows for a continuous chat between students, TA, and instructor. Course announcements will also be posted on discord. Here is the link: <https://discord.gg/aFTxaRyUz>. 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!

How Will I be Graded?

Type of Assignment	Percentage
Pre-lectures/Bridge Qs	5%
In-class Work	5%
Discussion	5%
Quizzes	5%
Homework	10%
Exams (4 @ 17.5% each)	70%
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 Achieve 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 Should I Do to Come Prepared for Class?

Coming prepared for class each day will be an essential component in your success in this course. Class time will mainly be spent on applying concepts and equations from the reading and pre-lecture videos meaning your first exposure to the week’s material will not be in class.

You will be introduced to the material through the textbook and pre-lecture videos on Achieve. Each unit has associated reading from the textbook, videos, and bridge questions that you must read, 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. Bridge questions may be graded either for participation, accuracy, or a combination of both.

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 reading the textbook and watching the videos which means taking notes; pausing and rewinding the videos; working out examples on your own; and writing down questions you have. Do not expect to get much out of class, discussion, or homework if you don’t put in a solid effort on the material before class.

The pre-class work will generally be due before class MWF at 12 PM. See the calendar on Achieve for the exact schedule.

What Will I Be Doing During Class?

We will mainly be working through examples and problems from the most recent Achieve units — not on introducing concepts and equations. Don’t expect to get much out of class if you haven’t put in a solid effort on the pre-class material (textbook & videos).

Poll Everywhere questions will be used to track attendance and promote active learning by providing instant feedback for both myself and for you. These 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 copying down every 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 what you learned from the pre-class material 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 both handwritten and electronic homework.

Electronic Homework: these are associated with each of the Achieve units and are usually due SuTuTh at 11:59 PM. 10 attempts per question with a 2% penalty for each attempt. You'll need to be correct to within 2% of the correct answer. Keep plenty of significant figures (at least four) for your answers as answers to early parts of a problem may be used later in the problem and rounding errors can cause you to miss a question even though your physics approach is correct. Even though it is electronic, keep a detailed record of your solutions that you can use to review and study from.

Handwritten Homework: these will usually be due on Fridays at the beginning of class and will consist of 2-4 longer problems. There will be a rubric used to grade these questions (similar to the rubric used on exams). Homework assignments can be found on Blackboard.

Homework Strategies: Before starting the homework, you should make sure you are able to solve and correctly think through the examples covered in the textbook, videos, class, and discussion. When you get stuck on a homework problem refer back to the covered 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 which will not set you up for success on the exams.

You are encouraged to work together, however, it is your responsibility to fully understand the material. Even though homework constitutes 10% of your overall grade, exams — for which you are solely responsible — make up the majority at 70%. Don't expect to do well unless you have put in serious effort on the homework.

What is Discussion?

Discussions are weekly meetings (Tuesdays 1-2:50 PM in ILSB 237) where you work on a packet of problems in small groups. It's designed to provide you with a supportive, collaborative learning environment so you can help and learn from each other.

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. Even though you work in groups, each student is responsible for completing their packet. Direct copying from another student is not allowed and will be penalized. Attendance at the discussion is mandatory and full attendance is required. If you arrive late to discussion, a late penalty may be imposed.

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 Quizzes Be Like?

There will be a 20 minute quiz in class every Friday. The quizzes are closed-book and closed-notes and generally covers material since the last quiz though any material covered in the course up to that point is fair game. It will consist of a mix of multiple choice, short answer, and free response questions. The best way to prepare is to review the recent class material, discussion, and homework.

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 70% of your overall grade. The textbook, pre-lectures, bridge questions, classes, discussions, quizzes, and homework are meant to help you acquire the conceptual and problem-solving skills you'll need to do well on them.

You will have three exams on Tuesdays (during the discussion period) tentatively set for Oct 3rd, Oct 31st, and Nov 28th. The final exam will be Dec 15th from 1-3 PM. More details on exam format will be provided closer to each scheduled exam.

What is the Make Up Policy?

- In-class Work: the three lowest grades (most classes will be poll everywhere questions) are dropped at the end of the semester. These count towards ALL absences and malfunctions.
- Achieve Pre-lecture, Bridge and Electronic Homework: a one-time extension of one week is available for either prelecture/bridge or homework. You must email me before the assignment due date to request an extension. Extensions will not be provided after the assignment due date.
- Handwritten Homework: no late submissions will be excepted.
- 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 the instructor as soon as possible to make an alternative arrangement.
- Quizzes: There are no make-up quizzes, however if you miss a quiz for legitimate reasons*, you must contact me as soon as possible.
- Exams: Make-ups should only occur in rare circumstances and will only be allowed for legitimate reasons*. You must contact me before the actual exam 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.

Accessibility and Disability Accommodations, Guidance and Resources (required)

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 creates 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.

SDS email: disAbility@umbc.edu

SDS phone: [410-455-2459](tel:410-455-2459)

If you will be using SDS approved accommodations in this class, please contact the instructor to discuss implementation of the accommodations. During remote instruction requirements due to COVID, communication and flexibility will be essential for success.

Sexual Assault, Sexual Harassment, and Gender Based Violence and Discrimination (required)

[UMBC Policy](#) in addition to federal and state law (to include Title IX) prohibits discrimination and harassment on the basis of sex, sexual orientation, and gender identity 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 related retaliation should contact the University's Title IX Coordinator to make a report and/or access support and resources. The Title IX Coordinator can be reached at titleixcoordinator@umbc.edu or 410-455-1717.

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 making a report, please use the [Online Reporting/Referral Form](#). Please note that, if you report anonymously, the University's ability to respond will be limited.

Notice that Faculty and Teaching Assistants are Responsible Employees with Mandatory Reporting Obligations

All faculty members and teaching assistants are considered Responsible Employees, per UMBC's [Policy on Sexual Misconduct, Sexual Harassment, and Gender Discrimination](#). Faculty and teaching assistants therefore required to report all known information regarding alleged conduct that may be a violation of the Policy to the Title IX Coordinator, even if a student discloses an experience that occurred before attending UMBC and/or an incident that only involves people not affiliated with UMBC. Reports are required regardless of the amount of detail provided and even in instances where support has already been offered or received.

While faculty members want to encourage you to share information related to your life experiences through discussion and written work, students should understand that faculty are required to report past and present sexual harassment, sexual assault, domestic and dating violence, stalking, and gender discrimination that is shared with them to the Title IX Coordinator so that the University can inform students of their [rights, resources, and support](#). While you are encouraged to do so, you are not obligated to respond to outreach conducted as a result of a report to the Title IX Coordinator.

If you need to speak with someone in confidence, who does not have an obligation to report to the Title IX Coordinator, UMBC has a number of [Confidential Resources](#) available to support you:

[Retriever Integrated Health](#) (Main Campus): 410-455-2472; Monday – Friday 8:30 a.m. – 5 p.m.; For After-Hours Support, Call 988.

[Center for Counseling and Well-Being](#) (Shady Grove Campus): 301-738-6273; Monday-Thursday 10:00a.m. – 7:00 p.m. and Friday 10:00 a.m. – 2:00 p.m. (virtual) [Online Appointment Request Form](#)

Pastoral Counseling via [The Gathering Space for Spiritual Well-Being](#): 410-455-6795; i3b@umbc.edu; Monday – Friday 8:00 a.m. – 10:00 p.m.

Other Resources

[Women's Center](#) (open to students of all genders): 410-455-2714; womenscenter@umbc.edu; Monday – Thursday 9:30 a.m. – 5:00 p.m. and Friday 10:00 a.m. – 4 p.m.

[Shady Grove Student Resources](#), [Maryland Resources](#), [National Resources](#).

[Child Abuse and Neglect](#)

Please note that Maryland law and [UMBC policy](#) require that faculty report all disclosures or suspicions of child abuse or neglect to the Department of Social

Services and/or the police even if the person who experienced the abuse or neglect is now over 18.

Pregnant and Parenting Students

UMBC's [Policy on Sexual Misconduct, Sexual Harassment and Gender Discrimination](#) expressly prohibits all forms of discrimination and harassment on the basis of sex, including pregnancy. Resources for pregnant, parenting and breastfeeding students are available through the University's [Office of Equity and Civil Rights](#). Pregnant and parenting students are encouraged to contact the Title IX Coordinator to discuss plans and ensure ongoing access to their academic program with respect to a leave of absence – returning following leave, or any other accommodation that may be needed related to pregnancy, childbirth, adoption, breastfeeding, and/or the early months of parenting.

In addition, students who are pregnant and have an impairment related to their pregnancy that qualifies as disability under the ADA may be entitled to accommodations through the [Office of Student Disability Services](#).

Religious Observances & Accommodations

UMBC [Policy](#) provides that students should not be penalized because of observances of their religious beliefs, and that students shall be given an opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances. It is the responsibility of the student to inform the instructor of any intended absences or requested modifications for religious observances in advance, and as early as possible. For questions or guidance regarding religious observances and accommodations, please contact the Office of Equity and Civil Rights at ecr@umbc.edu.

Hate, Bias, Discrimination and Harassment

UMBC values safety, cultural and ethnic diversity, social responsibility, lifelong learning, equity, and civic engagement.

Consistent with these principles, [UMBC Policy](#) prohibits discrimination and harassment in its educational programs and activities or with respect to employment terms and conditions based on race, creed, color, religion, sex, gender, pregnancy, ancestry, age, gender identity or expression, national origin, veterans status, marital status, sexual orientation, physical or mental disability, or genetic information.

Students (and faculty and staff) who experience discrimination, harassment, hate, or bias based upon a protected status or who have such matters reported to them should use the [online reporting/referral form](#) to report discrimination, hate, or bias incidents. You may report incidents that happen to you anonymously. Please note that, if you report anonymously, the University's ability to respond may be limited.