# **Physics 122H Introductory Physics II – Spring 2023**

Instructor: Dr. Henrique Barbosa | Physics R.416 | Phone: X51248 | Email: <u>hbarbosa@umbc.edu</u> Teaching Assistant: TBA

# **Class Meeting:**

Lecture:	Mon/Wed/Fri	9:00 – 9:50	Physics 107
Discussion:	Tuesday	9:00 - 10:50	ILSB 230

# Office Hours:

I will be available in my office on Monday, Wednesday, and Friday 10:00-12:00, and alternatively in the afternoon. This may vary week to week due to other teaching and research commitments. You may also make an appointment to meet at another time by contacting me through email. Appointments can be for individuals or groups.

# Course Overview:

Welcome to PHYS 122H! This course will take on two pillars of classical physics: thermodynamics and electromagnetism. The former involves heat, work, and temperature and their relation to energy, entropy, and the physical properties of matter. The latter (electricity and magnetism) covers charges, currents, and electric and magnetic fields under static and time-variable conditions. With these, we can grasp a great deal of phenomena, from the inner workings of combustion engines to clouds, from electronics to lightning, from observing stars with a kid's telescope in our backyard to grasping an understanding of the expansion of the universe.

This course is the second semester of the 4-credit, calculus-based, introductory physics courses. The Honors section of the course is a stand-alone course not part of the large-lecture course format, where we cover the same material in more depth. The goals of this course are (1) that you can demonstrate a conceptual understanding of the topics listed above, (2) that you are able to analyze, interpret, and model physical situations using the principles found in the above topics, and (3) that you can communicate your reasoning processes clearly through logical, coherent homework and exam solutions. I expect you to be able to work with these ideas and apply them to various physical situations by the end of the semester.

Finally, I should say I'm excited to teach this class and have high expectations for all of us. You will need to work hard to do well in this course, about 8-12 hours outside of class per week. This includes preparing for lecture, reviewing material, doing the assigned homework, and studying for exams. This course is not about memorization, but understanding and applying knowledge. Remember that getting help when you are having difficulty is part of life, but that exams are not a team sport. You must know the material. I promise you that I will be working just as hard as you to present the material and help you to understand it. <u>Please, do not leave three days go by where you are in the dark about some concept or some method of approaching problems.</u> See me or the T.A.'s for help.

# **Textbook and Materials:**

- 1. Physics for Scientist and Engineers, Tipler & Mosca (required) Chapters 17 to 30
- 2. FlipIt Physics (electronic pre-lectures and pre-lecture homework) (required)
- 3. Access to Poll Every Where (required)

This course is a CMI course and so the e-book comes with the class registration. You can access it through the Blackboard site, and you can download it using the VitalSource Bookshelf app. If you have any difficulties with the e-book, *Flip It Physics* site, or Poll Every Where, please contact Ms. Jocelyn Ochoa-Garcia <u>ochoa1@umbc.edu</u> at the Bookstore and she can guide you through things.

# **FliptIt Physics:**

We will use an on-line system called *Flipt It Physics*. This system has many features, and it includes prelecture material, pre-lecture questions (checkpoints), and electronic homework. To access *Flip It Physics*, go to their website: <u>http://FlipItPhysics.com</u>. Follow their directions to enroll as a student.

You need the course access key for this course: <u>phys122barbosa</u>. You'll also need your unique code received from the CMI coordinator at the UMBC bookstore. Finally, note that you need to enter an individual identifier and you must use your student ID number: the two-letter, five-digit on your student id card. Please be careful as you cannot change this once you have registered in *Flip It Physics*. Please note that you can start off in *Flip It Physics* with a 30-day, no-pay, grace period, however you need to pay for it either through their website or at the bookstore prior to the end of that period. If you fail to pay for it before your grace period expires all your material and grades for that part of the course will be lost.

# **Clickers:**

Devices called 'clickers' allows to instantly poll the class with multiple-choice questions, and they are great for getting instant feedback on what you do and don't understand. They are also used to track attendance and attention. We are going to use the **Poll Every Where** website, which you can access using your UMBC account, as a virtual clicker.

- PollEv Student FAQ: <u>https://wiki.umbc.edu/pages/viewpage.action?pageId=158761751</u>
- Login quickly with your UMBC credentials: <u>http://umbc.edu/go/pollev</u>

It is your responsibility to make sure the clicker software is working properly. Participation credit for lecture (through clicker responses) is worth 5% of your final grade. It is ok to get wrong answers on the clicker questions (but you should try your best), you are graded only on whether you answer or not.

Grading:	4 one-hour i	n-class exams	60%		
	Paper-based	l homework	15%		
	Electronic h	omework prol	blems 10%		
	Discussion c	lass	5%		
	Pre-lectures	and Checkpoi	ints 5%		
	Clicker respo	onse questions	s 5%		
	A: 90-100	B: 80-90	C: 70-80	D: 60-70	F: 0-60

# **Pre-Lectures and checkpoints:**

Pre-lectures are very well done, animated, PowerPoint presentations with voice-over. It is important that you go through these pre-lectures when they are assigned, including answering the embedded questions. These and reading the textbook sections prepare you for the lecture.

Checkpoint questions are a set of questions that are separate from the pre-lectures. They ensure that you think through the material you have viewed and give me a chance to see the class general understanding of the pre-lecture concepts. <u>Note that there is a set of pre-lectures and Checkpoint</u> <u>questions that you must do prior to the first class</u>.

# Lectures:

You are required to read the textbook material before coming to class. By this I do not mean that you should skim the material. You should read it, think about it, and formulate questions about the material. I expect class participation during the lecture. There will be clicker questions in many of the classes on the reading material and material we have already discussed, and questions meant to stimulate an active learning environment.

# **Discussion Classes:**

The discussion classes will address particularly difficult concepts and the practical matters of analyzing problems. They are a required part of the course, and you must attend the session or you will not receive credit for your work. The work in the discussion class will be done in small groups (2-3 students), and so it is critical that you are not late for this class. The discussion will be led by our Teaching Assistant.

# Homework:

This is one of the most important aspects of this class for learning the material. Although you will learn a lot from lectures and from studying the textbook, the only way to understand and integrate the material to the level that is expected is by personally working through the subject and applying it to various situations (problems). At times, the homework will be very challenging. Remember that it is the only time I can ensure that you examine a complicated problem. There is not enough time for this on exams.

The <u>first type of homework</u> is submitted electronically through the *Flip It Physics* website. You are responsible for checking the *Flip It Physics* calendar regularly to ensure you do not miss any of the assignments. Thus, you need to make sure that you have good access to the internet via a computer. This is available in the library and in the computer labs across campus, as well as your own home internet access. Most of the electronic homework problems are broken into multiple sections. It is good practice to write out the solution to each of the electronic homework problems on paper before submitting the answer, and then keeping the written solution to use in studying for exams.

<u>The second type is written homework</u>. These assignments will be posted on the Blackboard site under Written Homework Assignments. Write neatly, <u>staple the pages together</u>, <u>begin each problem on a new page</u>, and make sure that your name is on each page. If it is illegible or does not have a logical flow that can be followed, it will not be graded. There is no provision for late written homework.

# Tips from previous students

Here are two tips from students who have been successful in this course in the past. The first concerns the electronic homework. These should be written out as if you would hand them in to be graded. Keeping a notebook with these written out is a great way to be able to review questions before exams. The second idea that successful students have mentioned is a method to do the written homework. They recommend working out the solutions to the written homework problems, and then rewriting them on fresh paper. When you do this, you can put the solution in that nice neat coherent order. It turns out that this fits with research on best study practices, that this method forms an immediate review of the material.

I imagine that you will get together on a regular basis in small groups. This is a good tool if used properly and a disaster if used incorrectly. Once you have done your own studying and worked on the assigned problems, it is good to discuss the ideas with others. Please do not use it without working on the problems on your own. If you receive help on the written homework, you must reference this in the margin of the work. Each person must submit the written homework in their own hand, and it must be their work.

# **Tutoring Help:**

The Physics Department has its *Physics Tutorial Center* in room 225. The schedule for the tutorial center is posted outside of Room 225, but it is typically Monday-Thursday in the afternoons.

The Learning Resource Center has free tutors for this and many other 100- and 200-level courses. They are located on the third floor of Sherman Hall and more information is available at: <a href="https://academicsuccess.umbc.edu/tutoring/">https://academicsuccess.umbc.edu/tutoring/</a>

There is a Supplemental Instruction leader for the PHYS122 large-lecture course. She will make announcements on Blackboard to tell you where and when she will have meetings. These have been extremely useful for students in the past semesters. These meetings will have problems that you work through with the assistance of the SI leader.

# Academic Integrity:

I feel obligated to ensure that students know the repercussions of cheating. If you are found cheating, you will receive a zero for that work, and you will be reported to the Academic Conduct Committee. The University has a website that addresses the concepts of academic integrity: <a href="https://academicconduct.umbc.edu/">https://academicconduct.umbc.edu/</a>

Here is a statement from the Provost's Office:

# **UMBC Statement of Values for Academic Integrity**

"By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult UMBC policies".

#### Accessibility and Disability Accommodations, Guidance and Resources:

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 <u>sds.umbc.edu</u> for registration information and office procedures.

SDS email: <u>disAbility@umbc.edu</u> SDS phone: (410) 455-2459

If you will be using SDS approved accommodations in this class, please contact me (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:

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 <u>Online Reporting Form</u>. 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.

#### Notice that Faculty are Responsible Employees with Mandatory Reporting Obligations:

All faculty members are considered Responsible Employees, per <u>UMBC's Policy on Sexual Misconduct</u>, <u>Sexual Harassment, and Gender Discrimination</u>. Faculty are therefore required to report possible violations of the <u>Policy</u> to the Title IX Coordinator, even if a student discloses something they experienced before attending UMBC. While faculty members want you to be able to share information related to your life experiences through discussion and written work, students should understand that faculty are required to report Sexual Misconduct to the Title IX Coordinator so that the University can inform students of their <u>rights</u>, <u>resources</u> and <u>support</u>. 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 <u>Confidential Resources</u> available to support you:

- The <u>Counseling Center</u>: 410-455-2742 / After-Hours 410-455-3230
- University Health Services: 410-455-2542
- Pastoral Counseling via Interfaith Center: 410-455-3657; interfaith@umbc.edu

#### Other Resources:

- <u>Women's Center</u> (for students of all genders): 410-455-2714; womenscenter@umbc.edu.
- Shady Grove Student Resources, Maryland Resources, National Resources.

# Child Abuse and Neglect:

Please note that Maryland law and <u>UMBC policy</u> require that I report all disclosures or suspicions of child abuse or neglect to the Department of Social Services and/or the police.

#### Pregnancy

UMBC's <u>Policy on Sexual Misconduct, Sexual Harassment and Gender Discrimination</u> expressly prohibits all forms of Discrimination and Harassment on the basis of sex, including pregnancy. <u>Resources for pregnant</u> <u>students</u> are available through the University's Office of Equity and Inclusion. Pregnant and parenting students are encouraged to contact the Title IX Coordinator to discuss plans and assure ongoing access to their academic program with respect to a leave of absence or return following leave related to pregnancy, delivery, or the early months of parenting. In addition, students who are pregnant may be entitled to accommodations under the ADA through the <u>Student Disability Service Office</u>, and/or under Title IX through the <u>Office of Equity and Inclusion</u>.

# **Religious Observances & Accommodations**

UMBC <u>Policy</u> provides that students should not be penalized because of observances of their religious beliefs, 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 for religious observances in advance, and as early as possible. For questions or guidance or to request an accommodation, please contact the <u>Office of Equity and Inclusion</u> at oei@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, <u>UMBC Policy</u> 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 or who have such matters reported to them should use the <u>online reporting form</u> to report discrimination, hate or bias incidents; reporting may be *anonymous*.